

Meeting Date: Mar. 2, 2020

To: Traffic and Mobility Commission

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Subject: Draft Sustainable Mobility Plan

#### **Recommended Action**

Information only.

#### **Background**

Staff is submitting the draft Sustainable Mobility Plan to the Traffic and Mobility Commission to provide additional time to review the full document prior to consideration of this item at the April 6 meeting.

#### **Next Steps**

The Traffic and Mobility will receive a presentation and consider the draft Sustainable Mobility Plan at their next meeting on April 6. Staff will then present the final Sustainable Mobility Plan to City Council for adoption.

#### **Exhibits**

- 1. Draft Sustainable Mobility Plan
- 2. Appendix A Draft Sustainable Mobility Plan Existing Conditions Report



**FEBRUARY 2020** 

### **ACKNOWLEDGMENTS**

The Carlsbad Sustainable Mobility Plan document would not have been completed without the efforts of the following individuals:

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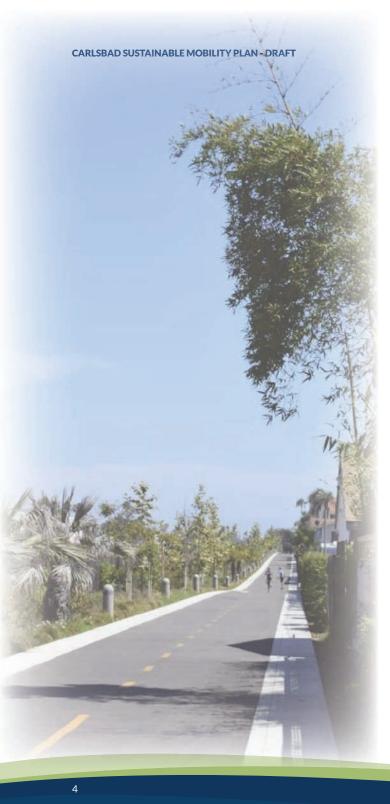
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**CARLSBAD SUSTAINABLE MOBILITY PLAN - DRAFT** 

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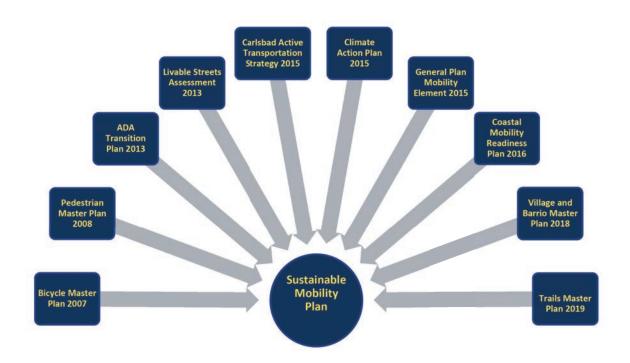
#### **EXECUTIVE SUMMARY**

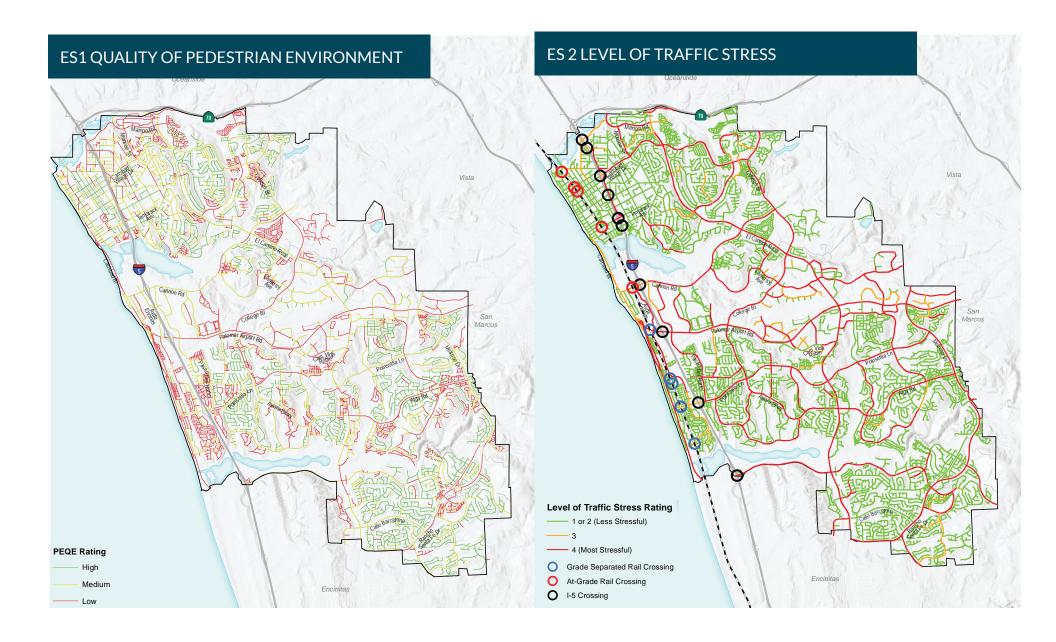
The Carlsbad Sustainable Mobility Plan (SMP) presents a comprehensive look at current active travel and transit conditions. as well as previous planning efforts to consolidate findings and recommendations into one master document. There are ten previous planning documents integrated into the SMP including the 2007 Bicycle Master Plan the 2008 Pedestrian Master Plan, the 2015 Comprehensive Active Transportation Strategy, the 2018 Village and Barrio Master Plan, the draft 2018 Transit and TDM Blueprint, the 2019 Trolley Program Feasibility Study, and the 2019 Trails Master Plan. A key goal of the SMP is to integrate planned, unbuilt projects from all of these plans into a single database; prioritize these planned, unbuilt projects; and thereby provide a significant tool to city staff for facilitating implementation of these multiple planned networks.

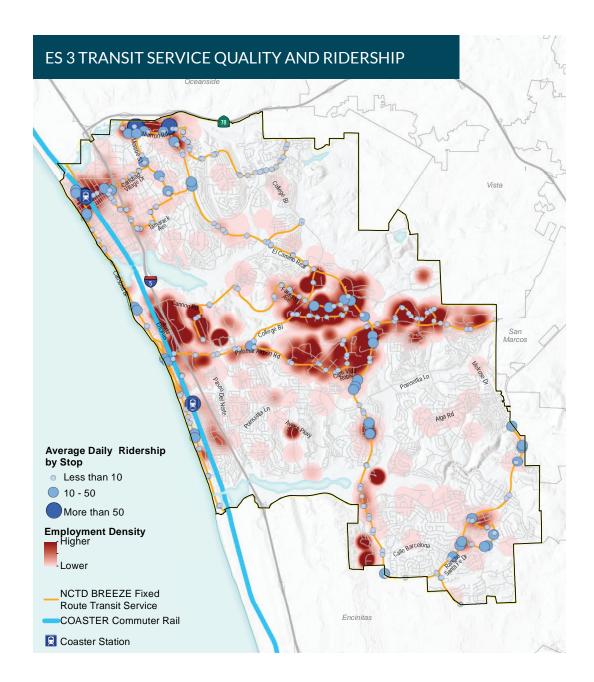
Chapter One of the SMP provides an overview of recent state legislation that motivates local government attention to improving the walking, cycling and transit environments within their jurisdictions. A series of over 15 pieces of state legislation have been adopted since 2006 to reduce vehicle-miles-traveled and greenhouse gas emissions, improve the safety of our most vulnerable travelers and encourage planning practices that result in sustainable outcomes rather than enhanced automobility. The

SMP is certainly in line with these directives from the state of California and also with the desires of community members who echo these concerns and wishes.

Chapter Two of the SMP highlights existing travel conditions and the need to address several shortcomings for people walking, riding a bike and using transit. Figures ES1 and ES2 on the following pages show results of the Pedestrian Environment Quality Evaluation (PEQE) and the Bicycle Level of Traffic Street (LTS), which reflect the overall comfort for cyclists and pedestrians. Figure ES3 shows employment density along with the existing transit network highlighting the high potential demand for transit in the central portion of Carlsbad. As shown, there are several gaps in these networks, and critical locations across the city suffer from poor quality walking and cycling environments and a sparse transit network.











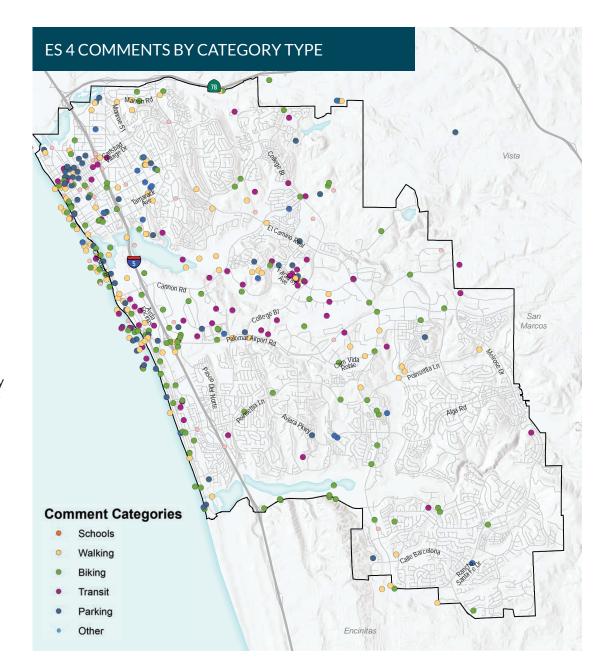
Chapter Three provides an overview of guiding planning principles and emerging mobility concepts that framed the SMP process.

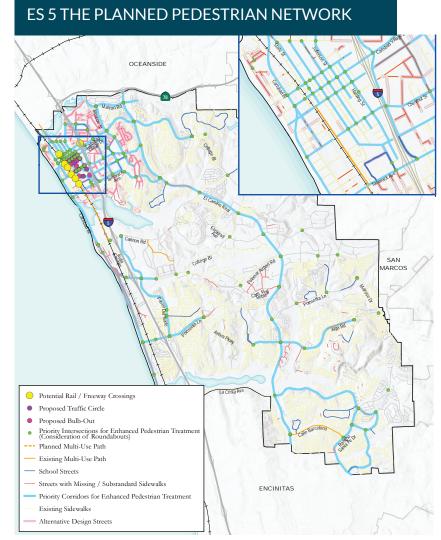
Chapter Four summarizes the spectrum of community outreach activities that were undertaken as part of the SMP process, including business and resident surveys, focus groups, formation of a stakeholder working group, a project website, community meetings and presentations, and outreach to cyclists via social media and guided tours.

Results of the online survey yielded several insights about community members' issues and desires. The figure to the right shows the magnitude of comments received via the online mapping tool, and whether the comment was about the school trip, walking, cycling, transit or parking.

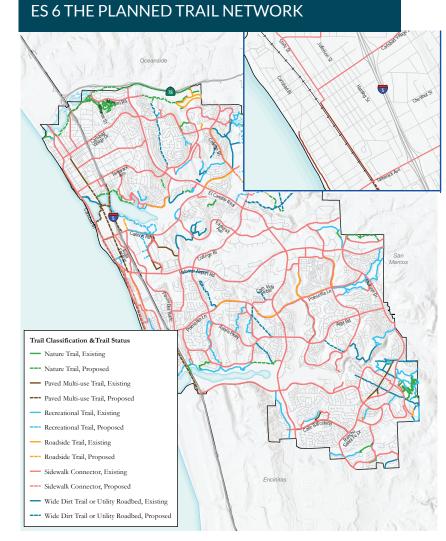
The most pressing issues identified by community members were related to innovation, location (or density), gap closure and first/last mile services. There is a strong desire on the part of the City of Carlsbad's residents to shift out of single occupant vehicles to transit, but access to transit is difficult.

Chapter Five presents the four planned networks as shown on the following pages for walking, trails, cycling and transit (see Figures ES5 through ES8). These recommendations were layered and combined into a Transformative Corridor Network which presents a well-connected, comfortable backbone network for more sustainable travel across the city. (See Figure ES9)





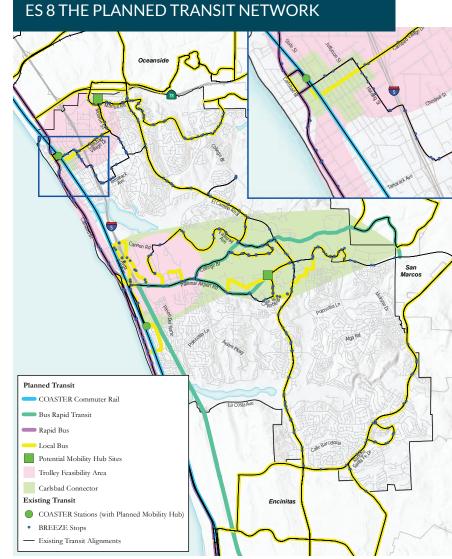
Pedestrian Classification	Existing	Adopted	Percent Change
Multi-Use	3.2	11.0	244%
Priority Corridors for Enhanced Treatment	0.0	54.4	-
Existing Sidewalks	833.9	833.9	0%
Missing/Substandard Sidewalks	30.0	30.0	0%
School Streets	13.4	13.4	0%
Alternative Streets	24.0	24.0	0%
Total	904.4	966.6	7%



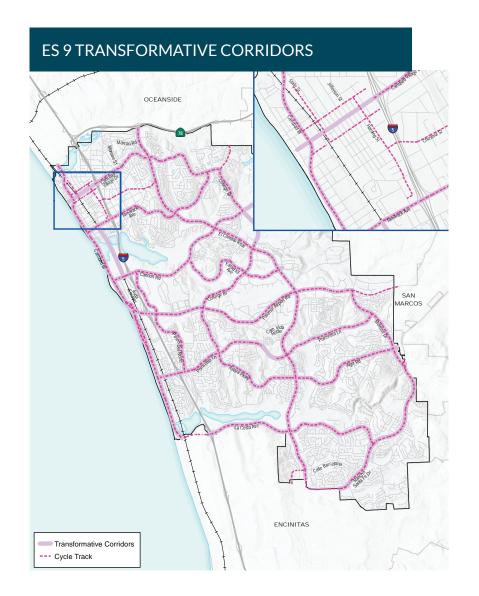
Trail Classification	Existing	Adopted	Percent Change
Nature	11.4	23.6	107%
Recreational	26.6	30.8	16%
Wide Dirt	13.2	22.2	68%
Roadside	7.8	11.8	51%
Sidewalk Connector	105.5	113.0	7%
Paved Multi-Use Path	7.8	17.4	123%
Total	172.3	218.7	27%

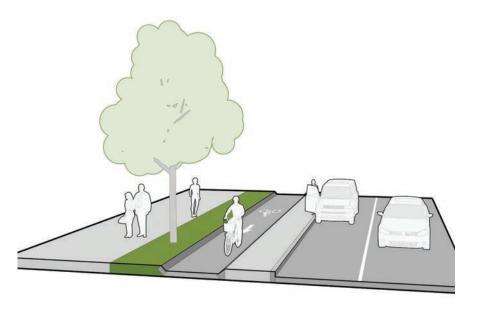


Bicycle Classification	Existing	Adopted	Percent Change
Multi-Use	3.2	10.6	230 %
Bike Lane	100.4	36.3	-64 %
Bike Route	5.1	6.8	34 %
Cycle Track	-	66.8	-
Bike Boulevard	-	0.4	-
Total	108.7	239.1	120%



Transit Classification	Existing	Adopted	Percent Change
Coaster Commuter Rail	6.6	6.6	0%
Bus Rapid	-	12.6	-
Rapid Bus	-	7.2	-
Local Bus	50.2	35.5	-29%
Total	56.8	61.9	9%



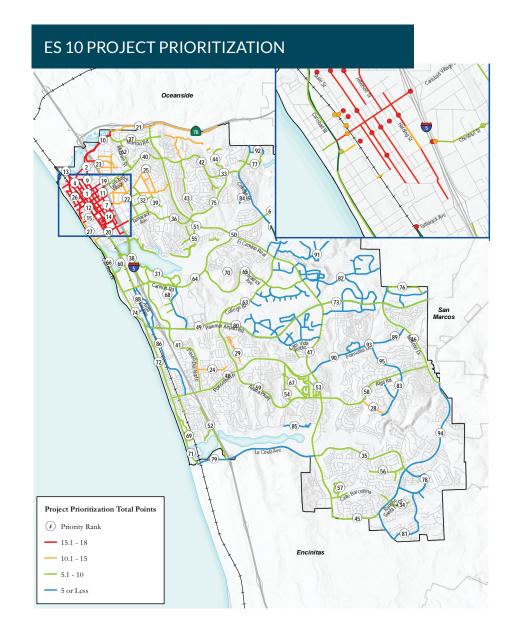


Conceptual cycle track with separated travelway for cyclists. (Source: Seattle.gov)

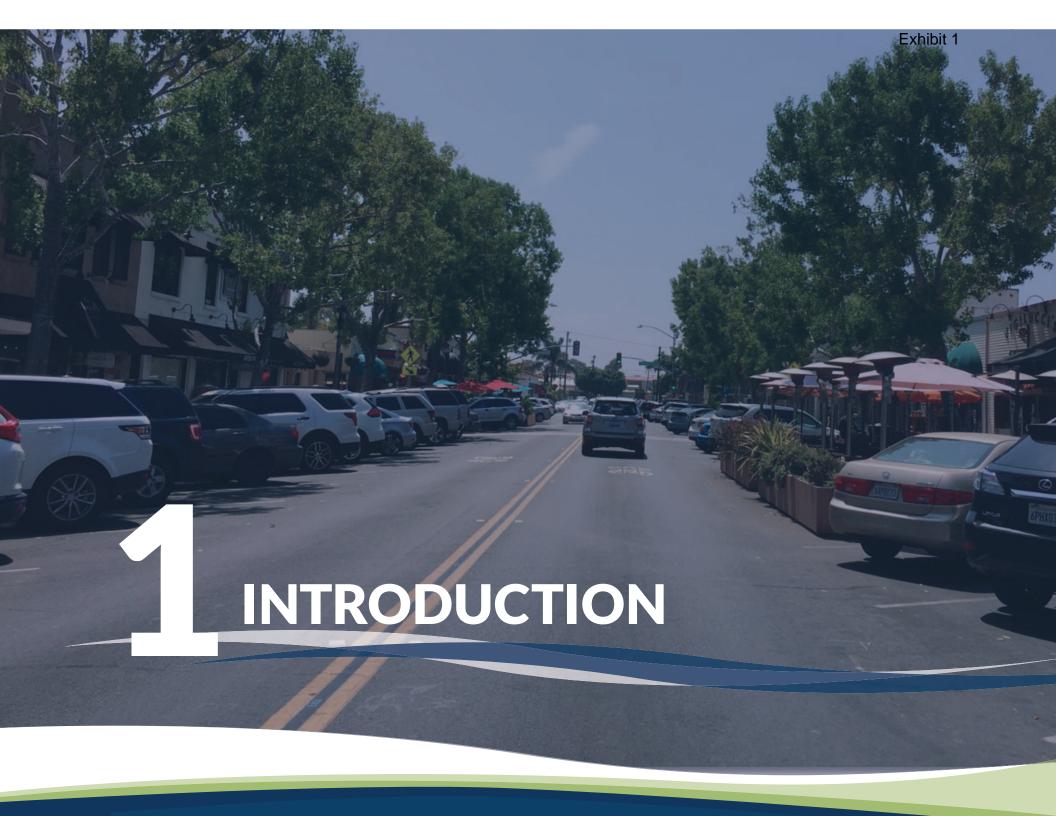
Chapter Six focuses on programmatic recommendations, specially Safe Routes to Schools (SRTS) and Transportation Demand Management (TDM). These programs hold strong promise for assisting two core city subpopulations — school children and workers — to change travel behavior to less polluting, healthier modes.

Chapter Seven presents the SMP action plan, which includes a presentation of the SMP project database and the prioritization of this database. The SMP project database reflects a comprehensive consolidation of planned unbuilt project recommendations from ten prior mobility planning efforts of the past twelve years, combined with new recommendations from the SMP.

The SMP project database includes 246 bicycle, pedestrian and transit recommendations across the city along corridors and across city subareas such as the Village, the Barrio or within school walkshed areas. The prioritization of these projects allows city staff and community members to understand which projects have the highest priority for implementation thereby providing direction for near-term and longerterm implementation. Figure ES 10 displays the final prioritization of the SMP project database. The map and accompanying project database provide a searchable tool for city staff that can be gueried and used to support efficient and timely implementation of mobility projects across the city.



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#### PURPOSE OF THE SUSTAINABLE PLAN

The City of Carlsbad Sustainable Mobility Plan (SMP) presents recommendations for reducing vehicle miles traveled, mitigating the impacts of growth and development, and shifting how residents get around the city away from private automobiles toward modes that are more livable, cleaner and healthier. This plan document builds upon important prior planning work in the city, including the City of Carlsbad General Plan Mobility Element, the Bicycle and Pedestrian Master Plans, the Village and Barrio Master Plan, the Comprehensive Active Transportation Strategy and recent initiatives such as the Climate Action Plan and the passage of the Transportation Demand Ordinance.

Increasing transportation options and improving connectivity within the city are core values of the Carlsbad Community Vision (Envision Carlsbad, 2010 and Carlsbad General Plan, 2015). Achieving increased travel options and connectivity will also support other values expressed in these plans such as sustainability, access to recreation and active, healthy lifestyles, and neighborhood revitalization.

In addition to the community's vision, the Carlsbad General Plan Mobility Element sets forth several goals related to sustainable mobility. These goals provide an important framework and foundation for the SMP.

Keep the City of Carlsbad moving with livable streets that provide a safe, balanced, cost-

#### IN THIS CHAPTER

- Purpose and context of Sustainable Mobility Plan
- Legislative framework for walking and biking improvements
- Community profile
- Caltrans active transportation checklist for statewide compliance

















effective, multi-modal transportation system (vehicles, pedestrians, bikes, transit), accommodating the mobility needs of all community members, including children, the elderly and the disabled. (3-G.1)

- Improve connectivity for residents, visitors and businesses. (3-G.2)
- Provide inviting streetscapes that encourage walking and promote livable streets. (3-G.3)
- Manage parking to support all modes of transportation and ensure efficient use of land. (3-G.4)
- Implement transportation demand and traffic signal management techniques to improve mobility. (3-G.5)
- Protect and enhance the visual, environmental and historical characteristics of the City of Carlsbad through sensitive planning and design of scenic transportation corridors.
   (3-G.6)
- Provide for the safe and efficient movement of goods throughout the city. (3-G.7)

Since adoption of the Mobility Element in 2015, the City of Carlsbad has actively been developing and implementing a series of stand-alone documents, technical analyses and recommendations related to walking and bicycling. The SMP is designed to serve as a "Plan of Plans" and help the city consolidate these multiple planning efforts over the previous 10 years in a manner that simplifies implementation and achievement of the overall goals for sustainable outcomes in the City of Carlsbad.

# WHY DO WE NEED A SUSTAINABLE MOBILITY PLAN?

The City of Carlsbad has extensive places for people walking and biking — sidewalks, bike lanes, crosswalks and many other features exist for the benefit of residents and visitors alike.

Recent research and analysis conducted as part of the SMP process confirms that the mere presence of these facilities does not always ensure safe walking and cycling, nor attract new users to these modes. A key goal of this document is to take additional steps to ensure safe travels and to create new users from people who would otherwise drive to their destination by providing appealing facilities for the most pedestrians and cyclists.



Carlsbad Boulevard in the 1980:

The SMP represents a critical step in developing a "toolbox" of new treatments designed to make it easier for casual users to use transit, walkways and bikeways for short, routine trips throughout the city, and with those trips, reduce vehicular congestion, improve safety and reduce emissions consistent with the city's Climate Action Plan.

#### HOW TO USE THIS DOCUMENT

- Chapter One: Introduction sets forth the SMP's vision, provides the legislative framework and summarizes the vision for the SMP as articulated by the Stakeholder Working Group.
- Chapter Two: Existing Mobility provides a snapshot of the existing physical environment and existing programs, practices and policies related to walking and cycling in the City of Carlsbad.
- Chapter Three: Guiding Principles and Emerging Mobility Trends presents overarching guiding principles motivating this planning process as well as several innovative planning concepts that inform the SMP's recommendations.
- Chapter Four: Community Perspectives provides a summary of the public engagement activities and outcomes that inform the SMP recommendations.
- Chapter Five: Planned Mobility Networks presents the SMP's planned networks for walking, cycling and transit with a focus on integrating recommendations from the city's multiple, previously adopted plans. The four modal networks were also used to develop a backbone network of Transformative Corridors which is presented at the end of this chapter. The four modal networks were also used to develop a backbone network of Transformative Corridors which is presented at the end of this chapter.
- Chapter Six: Proposed Mobility Programs presents key programmatic recommendations including those related to Bicycle Education, Safe Routes to School (SRTS), and Transportation Demand Management (TDM).
- Chapter Seven: Action Plan presents the consolidated SMP project database including
  project recommendations from 10 years of prior mobility planning in Carlsbad as well as new
  SMP recommendations. The action plan also presents the prioritization of these projects using
  criteria identified by the stakeholder working group and city staff. The identification of higher
  priority projects helps city staff to understand which projects should be implemented in the
  near-term versus long-term.

#### **COMMUNITY PROFILE**

The City of Carlsbad is located in Northern San Diego County, approximately 35 miles north of the City of San Diego and approximately 90 miles south of Los Angeles. The City of Carlsbad is bordered by the cities of Oceanside and Vista to the north, the City of San Marcos and unincorporated San Diego County to the east, the City of Encinitas to the south and the Pacific Ocean to the west.

Interstate 5 traverses the city in a northsouth direction, providing the primary northsouth freeway access to Carlsbad, while State Route 78 connects the northern portion of Carlsbad with communities to the east.

Along the coast, the city's terrain is relatively flat. However, as the city spreads easterly, the terrain becomes hilly.

The City of Carlsbad has several qualities contributing to a positive walking and cycling environment, including a temperate Southern California climate, an active population, high quality recreation opportunities and wide, new streets in many parts of the city that can, or already do, accommodate active transportation infrastructure.

# KEY THEMES FROM THE SMP PLANNING PROCESS

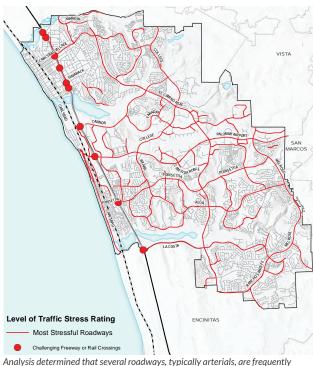
Based on the evaluation of the City of Carlsbad's safety, infrastructure and community perspectives, the following key themes and plan priorities were developed:

Enhance Existing Bikeways Along Major Arterials – The City of Carlsbad already has many miles of bicycle infrastructure. The challenge facing the city is how to retrofit this infrastructure, which is mostly bike lanes, to not only improve safety of existing cyclists, but to attract new users.

This can be achieved through implementation of protected bikeways, particularly along high speed roadways.

Improve Freeway Crossings and Intersections – Many freeway crossings and intersections at major roadways create physical and psychological barriers, as people do not feel safe walking or cycling through these areas.

Plan for Vulnerable Users – The development of an "8 to 80" network where people can comfortably walk and bike is critical to shifting mode choice away from driving. This is achieved by planning and designing facilities for those who are likely



Analysis determined that several roadways, typically arterials, are frequently inaccessible to casual users walking or biking, which limits connections throughout the City.

to benefit the most from protection on roadways – children and the elderly.

Innovate and Make Use of the City's Desirable Location to Attract Visitors, Employees and Employers – The City of Carlsbad has long sought a highly-skilled and highly-educated workforce, with an emphasis on technology and the pursuit of an active, enjoyable quality of life. With the emergence of multiple, new technologies, the city's transportation network should reflect this innovation, along with strong

workplace commuter programs, and a focus on maintaining its status as a family-oriented destination for people from all over the world.

#### APPLICABLE LEGISLATION

Several pieces of legislation support increased bicycling and walking in the state of California. Much of the legislation addresses greenhouse gas (GHG) reduction and points to bicycling and walking as a means to achieve reduction targets. The most relevant legislation concerning bicycle and pedestrian policy, planning, infrastructure and programs are described in the following sections.



Median Refuge for pedestrians crossing at mid-block locations

### AB-32 California Global Warming Solutions Act (2006)

AB-32 calls for the reduction of greenhouse gas emissions and codifies the 2020 emissions reduction goal. This act also directs the California Air Resources Board to develop specific early actions to reduce greenhouse gases while also preparing a scoping plan to identify how best to reach the 2020 limit.

### AB-1581 Bicycle and Motorcycle Traffic Signal Actuation (2007)

This bill defines a traffic control device as a traffic-actuated signal that displays one or more of its indications in response to the presence of traffic detected by mechanical, visual, electrical or other means. Upon the first placement or replacement of a traffic-actuated signal, the signal would have to be installed and maintained, to the extent feasible and in conformance with professional engineering practices, so as to detect lawful bicycle or motorcycle traffic on the roadway. Caltrans has adopted standards for implementing the legislation.

### SB-375 Redesigning Communities to Reduce Greenhouse Gases (2008)

This bill seeks to reduce vehicle miles traveled through land use and planning incentives. Key provisions require the larger

regional transportation planning agencies to develop more sophisticated transportation planning models, and to use them for the purpose of creating "preferred growth scenarios" in their regional plans that reduce greenhouse gas emissions. The bill also provides incentives for local governments to incorporate these preferred growth scenarios into the transportation elements of their general land use plans.

#### AB-1358 Complete Streets Act (2008)

AB-1358 requires the legislative body of a city or county, upon revision of the circulation element of their general plan, to identify how the jurisdiction will provide for the routine accommodation of all users of the roadway including drivers, pedestrians, cyclists, individuals with disabilities, seniors and public transit users. The bill also directs the Governor's Office of Planning and Research to amend guidelines for general plan circulation element development so that the building and operation of local transportation facilities safely and conveniently accommodates everyone, regardless of their travel mode.

#### Caltrans Deputy Directive 64-R1 (2008)

Deputy Directive 64-R1 is a policy statement affecting Caltrans mobility planning and projects requiring the agency to "...provide

for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations and maintenance activities and products on the state highway system. The Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian and transit modes as integral elements of the transportation system. The directive goes on to mention the environmental, health and economic benefits of more complete streets.

#### Deputy Directive 13-02

Deputy Directive 13-02 establishes that roundabout intersection proposals no longer



"Pedestrian Scramble" crosswalk in Carlsbad

require Conceptual Approval by Caltrans. It also establishes that roundabout intersection proposals shall be planned, developed, and evaluated in accordance with the National Cooperative Highway Research Program (NCHRP) Report 672 entitled "Roundabouts: An Informational Guide, 2nd Edition." This directive also supplements the California MUTCD warrant and engineering study requirements by adding yield control to the menu of options for intersection control.

### AB-1371 Passing Distance/Three Feet for Safety Act (2013)

This statute, widely referred to as the "Three Foot Passing Law," requires drivers to provide at least three feet of clearance when passing cyclists. If traffic or roadway conditions prevent drivers from giving cyclists three feet of clearance, they must "slow to a speed that is reasonable and prudent" and wait until they reach a point where passing can occur without endangering the cyclist. Violations are punishable by a \$35 base fine, but drivers who collide with cyclists and injure them in violation of the law are subject to a \$220 fine.

#### SB-743 CEQA Reform (2013)

Just as important as the aforementioned pieces of legislation that support increases in bicycling and walking infrastructure and accommodation is one that promises to

remove a longstanding roadblock to them. That roadblock is vehicular Level of Service (LOS) and the legislation with the potential to remove it is SB-743.

For decades, vehicular congestion has been interpreted as an environmental impact and has often stymied on-street bicycle projects in particular. Projections of degraded Level of Service have, at a minimum, driven up project costs and, at a maximum, precluded projects altogether. SB-743 could completely remove LOS as a measure of vehicle traffic congestion that must be used to analyze environmental impacts under the California Environmental Quality Act (CEQA).

This is extremely important because adequately accommodating cyclists, particularly in built-out environments, often requires relocation of right-of-way and the potential for increased vehicular congestion. The reframing of Level of Service as a matter of driver inconvenience, rather than an environmental impact, allows planners to assess the true impacts of transportation projects and will help support bicycling projects that improve mobility for all roadway users.

#### AB-1193 Bikeways (2014)

This act amends various code sections, all relating to bikeways in general, specifically by

recognizing a fourth class of bicycle facility, cycle tracks. However, the following may be even more significant to future bikeway development:

Existing law requires Caltrans, in cooperation with county and city governments, to establish minimum safety design criteria for the planning and construction of bikeways, and requires the department to establish uniform specifications and symbols regarding bicycle travel and traffic related matters. Existing law also requires all city, county, regional and other local agencies responsible for the development or operation of bikeways or roadways to utilize all of those minimum safety design criteria and uniform specifications and symbols.

This bill revises these provisions to require Caltrans to establish minimum safety design criteria for each type of bikeway by January 1, 2016, and also authorizes local agencies to utilize different minimum safety criteria if adopted by resolution at a public meeting.

## AB 902 Traffic Violations and Diversion Programs (2015)

Existing law provides that a local authority may not allow a person who has committed a traffic violation under the Vehicle Code to participate in a driver awareness or education program as an alternative to the

imposition of those penalties and procedures, unless the program is a diversion program for a minor who commits an infraction not involving a motor vehicle and for which no fee is charged.

This bill instead allows any person of any age who commits an infraction not involving a motor vehicle to participate in a diversion program that is sanctioned by local law enforcement. The bill eliminates the requirement that such a program charge no fee. The bill makes other technical, nonsubstantive changes.

### AB 1096 Electric Bicycles as Vehicles (2015)

Existing law defines a "motorized bicycle" as a device that has fully operative pedals for propulsion by human power and has an electric motor that meets specified requirements. The bill defines an "electric bicycle" as a bicycle with fully operable pedals and an electric motor of less than 750 watts, and creates three classes of electric bicycles.

The bill prohibits the operation of a class III electric bicycle on specified paths, lanes or trails, unless that operation is authorized by a local ordinance. The bill also authorizes a local authority or governing body to prohibit, by ordinance, the operation of class 1 or class 2 electric bicycles on specified paths or trails.

#### SB-1 Transportation Funding (2017)

This bill creates the Road Maintenance and Rehabilitation Program to address deferred maintenance on the state highway system and the local street and road system. A total of \$5.4 billion will be invested annually over the next decade, which will undertake a backlog of repairs and upgrades. Additionally, cleaner and more sustainable travel networks will be ensured for the future, including upgrades to local roads, transit agencies and an expansion of the state's growing network of pedestrians and bicycle routes.

### SB-672 Traffic-Actuated Signals: Motorcycles and Bicycles (2017)

This bill extends indefinitely the requirement to install traffic-actuated signals to detect lawful bicycle or motorcycle traffic on the roadway. By extending indefinitely requirements regarding traffic-actuated signals applicable to local governments, this bill imposed a state-mandated local program.

Existing law requires the state to reimburse local agencies and school districts for certain costs mandated by the state.

AB-1218 California Environmental Quality Act Exemption: Bicycle Transportation Plans (2017) This bill extends CEQA exemptions for bicycle transportation plans for an urbanized area until January 1, 2021. These exemptions include re-striping of streets and highways, bicycle parking and storage, signal timing to improve street and highway intersection operations, and related signage for bicycles, pedestrians and vehicles under certain conditions. Additionally, CEQA will also exempt from its requirements projects consisting of re-striping of streets and highways for bicycle lanes in an urbanized area that are consistent with a bicycle transportation plan under certain conditions.

Planning projects such as this document are exempt from CEQA analysis since they provide planning and conceptual recommendations. As individual recommendations move forward toward further design and implementation, the city will then need to determine if there are environmental impacts that may warrant an EIR.

A project involving only feasibility or planning studies for possible future actions which the agency, board or commission has not approved, adopted or funded does not require the preparation of an EIR or Negative Declaration but does require consideration of environmental factors. This section does not

apply to the adoption of a plan that will have a legally binding effect on later activities.

## SB-760 Transportation Funding: Active Transportation: Complete Streets (2019)

This bill establishes a Division of Active
Transportation within Caltrans to give
attention to active transportation program
matters to guide progress toward meeting
the department's active transportation
program goals and objectives. This bill
requires the California Transportation
Commission to give high priority to increasing
safety for pedestrians and bicyclists and to
the implementation of bicycle and pedestrian
facilities. The bill also directs the department
to update the Highway Design Manual
to incorporate "complete streets" design
concepts, including guidance for selection of
bicycle facilities.

# CALTRANS ACTIVE TRANSPORTATION CHECKLIST

In order to comply with Caltrans requirements and to keep the city competitive in future grant opportunities, the table on the following page lists items that are addressed in the SMP.





#### Table 1-1 Caltrans Active Transportation Plan Checklist

ltem	Location in Plan
The estimated number of existing bicycle trips and pedestrian trips in the plan area, both in absolute numbers and as a percentage of all trips and the estimated increase in the number of bicycle trips and pedestrian trips resulting from implementation of the plan.	Chapter 2 & 6
The number and location of collisions, serious injuries and fatalities suffered by bicyclists and pedestrians in the plan area, and a goal for collision, serious injury and fatality reduction after implementation of the plan.	Chapter 2
A map and description of existing and proposed land use and settlement patterns which must include, but not be limited to, locations of residential neighborhoods, schools, shopping centers, public buildings, major employment centers and other destinations.	Chapter 2
A map and description of existing and proposed bicycle transportation facilities, including a description of bicycle facilities that serve public and private schools and, if appropriate, a description of how the five E's (Education, Encouragement, Enforcement, Engineering and Evaluation) will be used to increase rates of bicycling to school.	Chapter 2 & Appendix E
A map and description of existing and proposed end-of-trip bicycle parking facilities.	Chapter 2
A description of existing and proposed policies related to bicycle parking in public locations, private parking garages and parking lots and in new commercial and residential developments.	Chapter 2
A map and description of existing and proposed bicycle transport and parking facilities for connections with and use of other transportation modes. These must include, but not be limited to, bicycle parking facilities at transit stops, rail and transit terminals, ferry docks and landings, park and ride lots, and provisions for transporting bicyclists and bicycles on transit or rail vehicles or ferry vessels.	Chapter 2
A map and description of existing and proposed pedestrian facilities, including those at major transit hubs and those that serve public and private schools and, if appropriate, a description of how the five E's (Education, Encouragement, Enforcement, Engineering and Evaluation) will be used to increase rates of walking to school. Major transit hubs must include, but are not limited to, rail and transit terminals, and ferry docks and landings. A description of proposed signage providing wayfinding along bicycle and pedestrian networks to designated destinations.	Chapters 2 & 5
A description of the policies and procedures for maintaining existing and proposed bicycle and pedestrian facilities, including, but not limited to, the maintenance of smooth pavement, ADA level surfaces, freedom from encroaching vegetation, maintenance of traffic control devices including striping and other pavement markings, and lighting.	Chapter 6
A description of bicycle and pedestrian safety, education and encouragement programs conducted in the area included within the plan. Efforts by the law enforcement agency having primary traffic law enforcement responsibility in the area to enforce provisions of the law impacting bicycle and pedestrian safety, and the resulting effect on collisions involving bicyclists and pedestrians are also included.	Chapter 6
A description of the extent of community involvement in development of the plan, including disadvantaged and undeserved communities.	Chapter 4
A description of how the active transportation plan has been coordinated with neighboring jurisdictions, including school districts within the plan area, and is consistent with other local or regional transportation, air quality or energy conservation plans, including, but not limited to, general plans and a Sustainable Community Strategy in a Regional Transportation Plan.	Chapter 2 & 3
A description of the projects and programs proposed in the plan and a listing of their priorities for implementation, including the methodology for project prioritization and a proposed timeline for implementation.	Chapter 6
A description of past expenditures for bicycle and pedestrian facilities and programs, and future financial needs for projects and programs that improve safety and convenience for bicyclists and pedestrians in the plan area. Include anticipated revenue sources and potential grant funding for bicycle and pedestrian uses.	Chapter 6
A description of steps necessary to implement the plan and the reporting process that will be used to keep the adopting agency and community informed of the progress being made in implementing the plan.	Chapter 6





### **EXISTING MOBILITY NETWORKS**

#### **CARLSBAD TODAY**

This chapter summarizes the current mobility context of the City of Carlsbad with a focus on previously adopted mobility plans, land use and socio-economic conditions, and most importantly, the status of current networks, travel demands and safety for walking, cycling and transit. This chapter lays the foundation for identifying key opportunities for the SMP to integrate and strengthen walking, cycling and transit networks and user experience across the city. The draft SMP Existing Conditions Report is provided in Appendix A.

The SMP will lay the foundation for improving mobility for all modes of travel, including pedestrians and bicyclists, within the City of Carlsbad. This represents the city's inaugural Sustainable Mobility Plan, building upon recommendations set forth in numerous plans proceeding this effort including, the Trails Master Plan (2019), the Carlsbad Coastal Mobility Readiness Plan (2016), the General Plan Mobility Element (2015), the Climate Action Plan (2015), Carlsbad Active Transportation Strategy (2015), Livable Streets Assessment (2013), Americans with Disabilities Transition Plan for Public Rights-of-Way (2013), the Pedestrian Master Plan (2008), the Bicycle Master Plan (2007) and SANDAG's San Diego Regional Safe Routes to School Strategic Plan (2012). The final section of this chapter assesses how well key destinations across the City of Carlsbad are served by the existing bike, pedestrian and transit networks. The "gap" analysis provides important input to the project prioritization mentioned in the final chapter of this document.

In addition to building on the previously adopted plans, the SMP will update the 10-year-old Pedestrian Master Plan and the 11-year-old Bicycle Master Plan. It will also provide the opportunity for collaboration among the City of Carlsbad's Transportation, Parks and Economic Development departments.

#### IN THIS CHAPTER

- Analysis of current conditions for people walking and biking, particularly vulnerable users
- Identification of network gaps serving key City of Carlsbad destinations

#### PRIOR PLANNING CONTEXT

#### Bikeway Master Plan (2007)

In December 2007, the City of Carlsbad adopted the Bikeway Master Plan as a blueprint for bicycle transportation and recreation in the City of Carlsbad. The Bikeway Master Plan provided an updated network of planned bikeway facilities.

#### Pedestrian Master Plan (2008)

In August of 2008, the City Council adopted the Pedestrian Master Plan. The vision of the Pedestrian Master Plan is multi-pronged. It envisioned a future City of Carlsbad where:

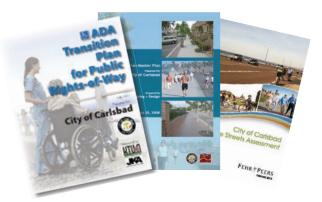
- People can conveniently walk to their destinations
- People feel safe walking
- Facilities are provided for people from all age groups
- People with disabilities are more easily mobile
- Visitors are attracted to the enhanced walking environment
- Commercial streets are exciting places to visit.

#### ADA Transition Plan for Public Right-of-Way (2012)

The Americans with Disabilities Act (ADA), enacted in 1990, extends comprehensive civil rights protections to all people with disabilities. The ADA Transition Plan for Public Right-of-Way outlines a comprehensive approach to removing public barriers to walking by mapping out a program that will transition the City of Carlsbad to comply with ADA and Title 24 requirements. The primary goal of the project is to provide a complete and accurate survey of walking facilities within the public right-of-way in the designated tier areas that can then be addressed as part of a broader strategic "Transition Plan."

#### City of Carlsbad Livable Streets Assessment (2013)

In 2012, Livable Streets was a City of Carlsbad City Council priority and strategic focus area for further enhancing the City of Carlsbad's outstanding quality of life. It was partially used as a way to incorporate the feedback received from the Envision Carlsbad General Plan Update process regarding the challenges, values, needs and wants of the community.



Planning documents used to identify future projects

### City of Carlsbad Active Transportation Strategy (2015)

The Carlsbad Active Transportation Strategy (CATS) is divided into five chapters: Where We Have Been, Gap Analysis, Roadmap to Livable Streets, Priority Projects, Measures of Effectiveness.

#### Climate Action Plan (2015)

The City of Carlsbad has long been a steward of environmental sustainability. In 2007, the City of Carlsbad City Council adopted a set of sustainability and environmental guiding principles (Resolution No. 2007-187) to help guide city investments, activities, and programs. Additionally, sustainability emerged as a key theme during the Envision Carlsbad community outreach process, and reflected as a Core Value of the Community

Vision. City Council adopted the Climate Action plan in 2015. The CAP includes goals, policies and actions for the City of Carlsbad to reduce GHG emissions and combat climate change and includes:

- An inventory of the City of Carlsbad's citywide and local government GHG emissions:
- Forecasts of future citywide and local government GHG emissions;
- A comprehensive, citywide strategy and actions to manage and reduce GHG emissions, with emission targets through 2035; and
- Actions that demonstrate the City of Carlsbad's commitment to achieve state GHG reduction targets by creating enforceable measures, and monitoring and reporting processes to ensure targets are met.

The time frame for the Plan extends from the date of adoption through 2035.

#### General Plan Mobility Element (2015)

A component of the larger General Plan, the mobility element is required by state law. The introduction includes a background and purpose, and notes that the primary

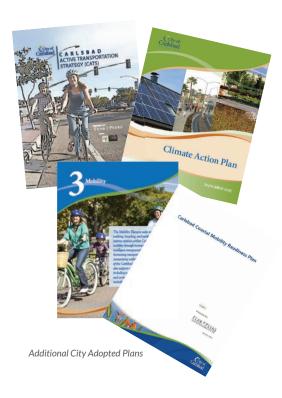
transportation issues facing the City of Carlsbad relate to protecting and enhancing the community's quality of life, as reflected in the core values of the Carlsbad Community Vision. The report goes on to state that the community's vision includes "better pedestrian and bicycle connections between neighborhoods, destinations and different parts of the community, and a balanced transportation system rather than a singular focus on automobile movement."

### Carlsbad Coastal Mobility Readiness Plan (Draft 2016)

The Carlsbad Coastal Mobility Readiness
Plan was developed to help stakeholders and
constituents envision a coastal transportation
system that connects people, creates a sense
of belonging and closely links quality of
life issues to economic growth. The report
was designed as a blueprint for building the
infrastructure to meet the mobility needs of
the community, encourage healthy lifestyles
and support a vibrant downtown setting.

#### Carlsbad Village, Barrio and Beach Areas Parking Management Plan (2017)

In support of the proposed Village and Barrio Master Plans, the city conducted a comprehensive parking study and developed a Parking Management Plan for the Carlsbad



Village, the Barrio neighborhood and adjacent beach areas. The adjacent beach area was included to provide the full picture of parking along the coast and its potential impact on Carlsbad Village.

City Council adopted the Parking Management Plan in 2017. The Parking Management Plan provides implementable short-term (by year 2020), medium-term (by year 2025) and long-term (by year 2035) strategies to improve the efficiency and effectiveness of the parking system. These strategies focus on the Village and Barrio and, in turn, the proposed Village and Barrio Master Plan.

The goals of the parking management plan are:

- Make parking more convenient for community members, employees and visitors
- Promote more efficient use of existing parking
- Support future parking needs and mobility options
- Explore options to make the project area more inviting for pedestrians, bicyclists and people who use public transportation
- Support the vision outlined in the Draft Village and Barrio Master Plan (April 2016)

#### Village and Barrio Master Plan (2018)

The master plan focuses on enhancing neighborhood character, public spaces, and ways to get around the Village and Barrio, based on ideas gathered from the community starting in September 2014.

The plan was approved by City Council on

July 10, 2018.

#### Trails Master Plan (2019)

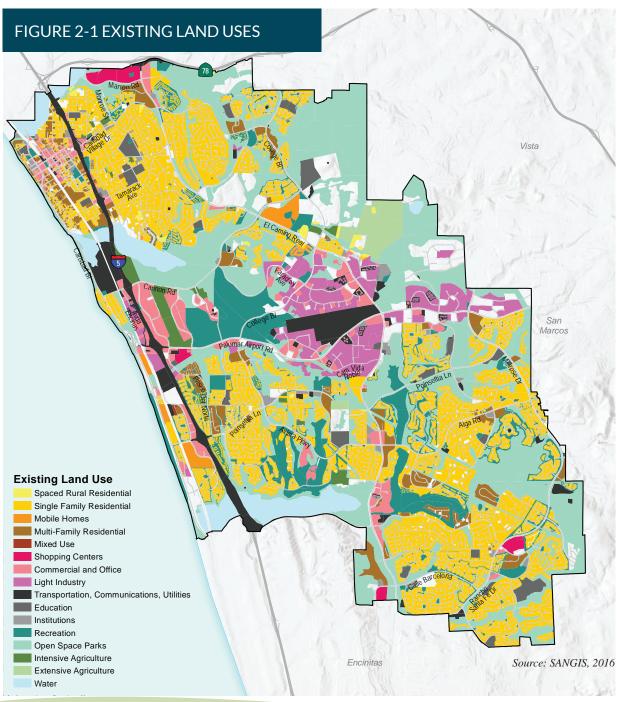
The City of Carlsbad has a citywide Trails Program with a mission statement of "... striv[ing] to meet the leisure and recreational needs of Carlsbad residents while protecting and preserving open spaces and coastal resources in accordance with the City of Carlsbad General Plan."

Four goals are identified within the Carlsbad TMP. These Include:

- Goal 1: Create a Connected and Complete Trails System
- Goal 2: Accommodate a Variety of Trail Users in a Safe and Environmentally Sensitive Manner
- Goal 3: Identify Existing & Future Trail Development
- Goal 4: Integrate Transportation Related Facilities as Part of the Trails System



Carlsbad Village Streetscape



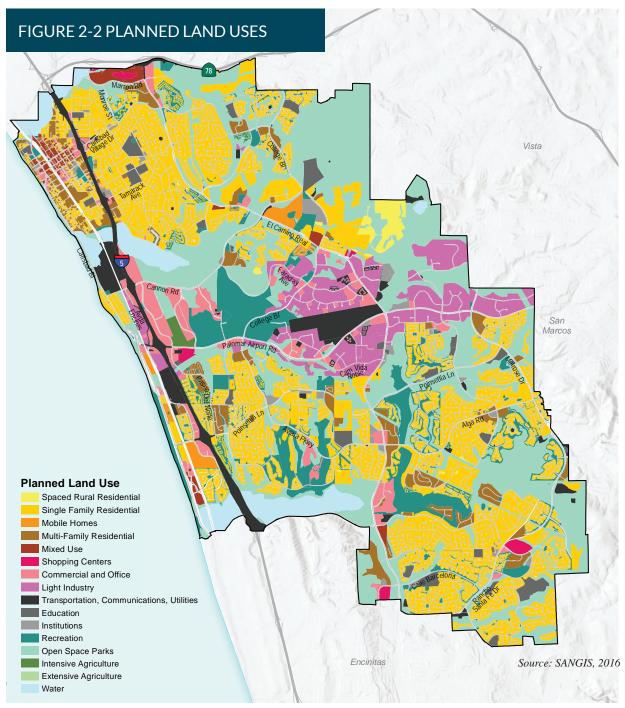


Downtown Carlsbad

### LAND USES, SOCIO-ECONOMIC AND TRAVEL CHARACTERISTICS

The City of Carlsbad began as a small coastal town, and its settlement pattern is typical of most coastal Southern California cities. The original downtown, known today as the Carlsbad Village, is characterized by a mix of commercial and residential land uses, narrow tree-lined streets arranged in a grid pattern, and has been served by rail service for over 100 years.

Beginning in the postwar years of the late 1940s, development accelerated, bringing greater numbers of employees and residents. Despite this development, significant amounts of nearby land remained as undeveloped open space. Throughout the second half of the 20th Century, housing frequently took the shape of master-planned developments adjacent to major vehicular arterials. Employment centers were also developed as standalone sites, separate from housing and commercial land uses. Currently, employment is predominately located between Cannon Road to the north and Palomar Airport Road to the south.

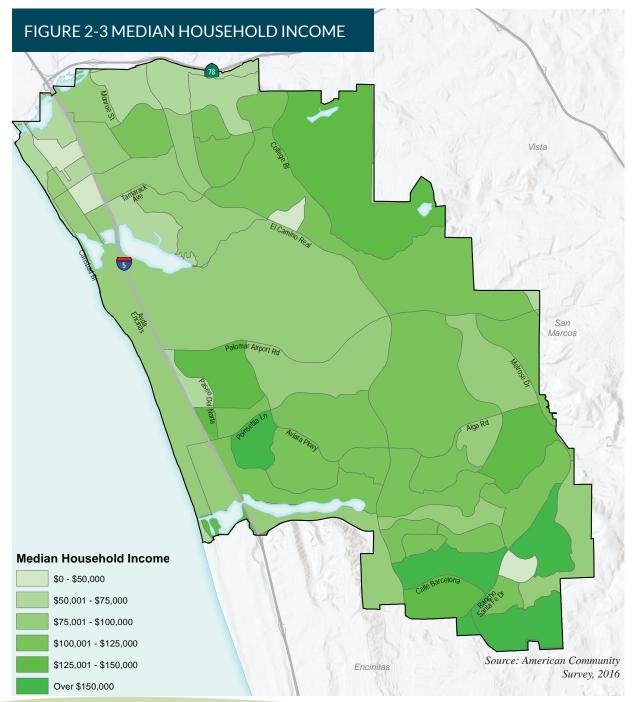


### Planned Land Uses

The notable differences between the City of Carlsbad's existing land use and the planned land uses depicted in Figure 2-2, is an increase in single family residential northeast of El Camino Real and College Boulevard, and an increase in light industrial in the area north of Faraday Avenue, directly west of the intersection of Faraday Avenue and S. Melrose Drive. The planned land uses also include an increase in mixed commercial directly south of the intersection of Avenida Encinas and Carlsbad Boulevard near the southern boundary of the city.



A commercial district "Bike Corral"



### Socio-Economic Conditions

Figure 2-3 displays 2016 median household income for the City of Carlsbad by census block group.

Disadvantaged or low-income communities are defined by the Caltrans 2019 Regional ATP Program Guidelines as having a median household income less than 80 percent of the statewide median based on the most current census data from the 2016 American Community Survey, which is less than \$51,026.

According to the map, there are four low-income census block groups, two of which are located in the Village Barrio zone of the City of Carlsbad, where the median household income is roughly \$47,000.

The neighborhood southeast of the intersection of La Costa Avenue and Rancho Santa Fe Road, near Stagecoach Community Park, has a median household income of about \$48,000.

Lastly, the lowest median household income is found in the neighborhood east of the intersection of Cannon Road and El Camino Real, with a median household income of about \$34,000.

FIGURE 2-4 MODE SHARE/TRAVEL TIME TO WORK

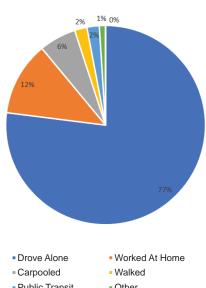
### **Travel Characteristics**

According to the American Community Survey 5-Year Estimate (2016), the City of Carlsbad has similar but slightly higher rates of commuters driving alone to work than San Diego County as a whole. In addition, there are slightly higher rates of residents working at home in Carlsbad compared to the county as a whole. Also noteworthy is a lower percentage of Carlsbad residents who carpool, take public transportation, walk to work, ride a bicycle, or commute via some other means as compared to San Diego County as a whole. These findings indicate a strong potential for change.

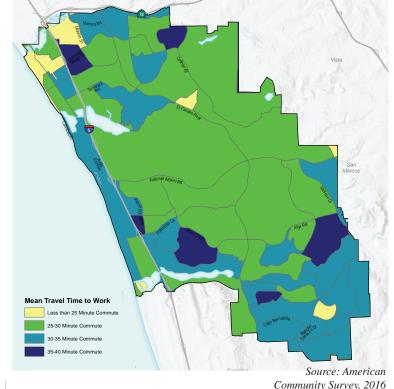
The 2016 mean travel time for working residents of the City of Carlsbad is about 28.6 minutes.

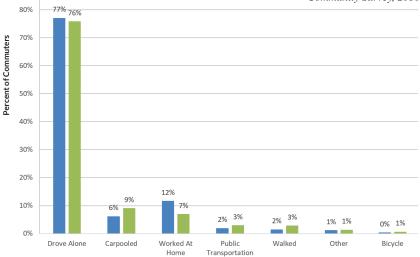
Figure 2-4 displays travel time to work and commute mode shares by census block group for working residents of the City of Carlsbad. As can be seen, most residents have an average commute lasting between 25 - 30 minutes. Very few residents have an average commute time of less than 25 minutes.

### Carlsbad Commute Mode Share



- Public Transit
- Other
- Bicycled









Typical Sidewalk Environment in the Village

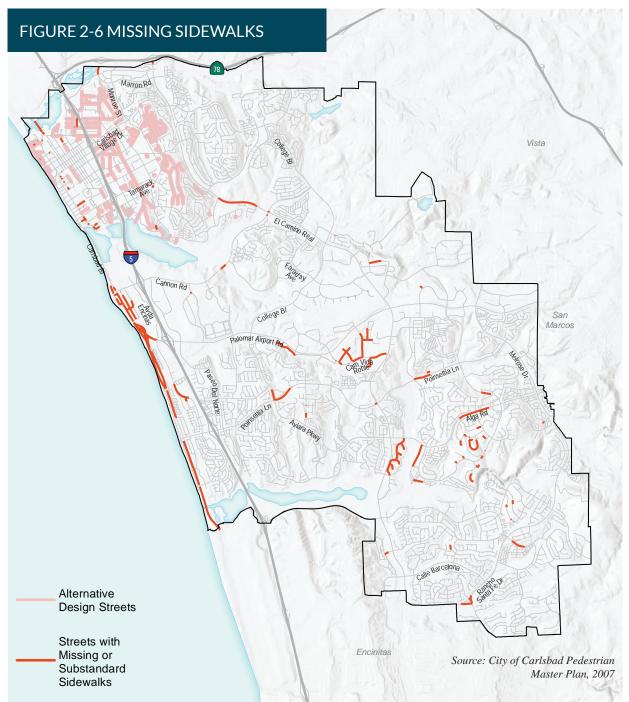
# CURRENT PEDESTRIAN CONDITIONS

This section of the SMP summarizes current pedestrian conditions in terms of the existing pedestrian network conditions, pedestrian activity levels and pedestrian safety across the city. These facets of the current pedestrian conditions, along with extensive community input, establish the basis for pedestrian recommendations presented in chapter five of the SMP.

### Pedestrian and Trail Network

The current pedestrian network includes not only the city's sidewalk network, but also the trails, paths and connectors identified in the Trails Master Plan. Figure 2-5 shows existing travelways available to pedestrians across the city. There are approximately 481 miles of sidewalk, 4.5 miles of multi-use paths and 5.5 miles of trails.

There are different types of existing sidewalks in the City of Carlsbad. The typical sidewalk environment in the Village is



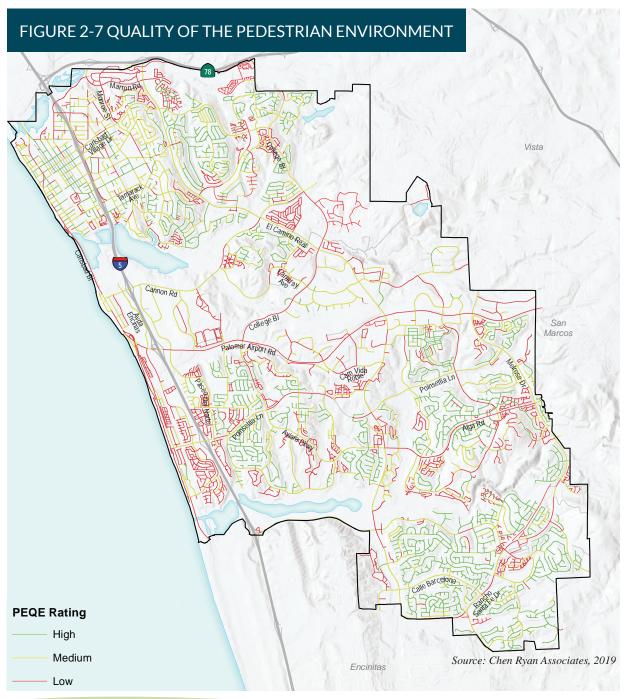


Missing Sidewalks in Carlsbad; residential area (left) and high-speed roadway (right)

pedestrian-friendly, with street trees, amenities and artistic features. Most importantly, the decorative sidewalk is typically 10-15 feet wide, providing a comfortable environment for walking. Most intersections are ADA compliant, and almost all corners have ramps. Most of the City of Carlsbad's beaches are easily accessible by foot. In fact, there is a large portion of the coast that has a dedicated pathway at sea-level in addition to the high-quality pathways on the top of the cliffs at street level. Specifically, Carlsbad State Beach to Tamarack Beach is a prime example of this feature.

### Missing Sidewalks

Figure 2-6 shows the missing or substandard sidewalks in the City of Carlsbad. In total, 30 miles of roadway are without sidewalks or with substandard sidewalks, although several of these locations are considered "Alternative Design Streets," and are not intended to be constructed or retrofitted with sidewalks. These areas include small neighborhood streets and wide, high-speed corridors.





Sidewalks along Carlsbad beaches

### Quality of the Pedestrian Environment

All public roadways in the City of Carlsbad were evaluated using the Pedestrian Environment Quality Evaluation (PEQE) tool. This tool allows for an objective assessment of the quality of the pedestrian environment taking into consideration the speed of vehicles along the roadway and the buffer distance between pedestrian travelways and moving vehicles. Table 2-1 displays the PEQE criteria and scoring system.

As shown in Table 2-1, the PEQE analysis involves assigning a score to each side of a roadway segment based on four measures: horizontal buffer, lighting, clear pedestrian zone and posted speed limit. The scores for each side of the roadway are averaged together to display a single segment score.

Figure 2-7 displays the quality of the pedestrian environment along each roadway segment in the City of Carlsbad. As shown, the Village area and areas east of the Village show relatively higher quality pedestrian environments, as do other residential pockets in the southern portion of the city.

Table 2-1 PEQE Ranking System and Criteria

Facility Type	Measure	Description/Feature	Scoring
<b>Segment</b> between two	1. Horizontal Buffer	Between the edge of auto travel way and the edge of clear pedestrian zone	0 point: < 6 feet 1 point: 6 - 14 feet 2 points: > 14 feet or vertical buffer
	2. Lighting		0 point: below standard/requirement 1 point: meet standard/requirement 2 points: exceed standard/requirement
intersections	3. Clear Pedestrian Zone	5' minimum	0 point: has obstructions 2 points: no obstruction
	4. Posted Speed Limit		0 point: > 40 mph 1 point: 30 - 40 mph 2 points: < 30 mph
Maximum 8 points			
	1. Physical Feature	Enhanced/High Visibility Crosswalk     Raised Crosswalk	0 point: < 1 feature per ped crossing 1 point: 1 – 2 features per ped crossing
		<ul><li>Advanced Stop Bar</li><li>Bulb out/Curb Extension</li></ul>	2 points: > 2 features per ped crossing
Intersection by Leg	2. Operational Feature	·	
Intersection by Leg	Operational Feature     ADA Curb Ramp	<ul> <li>Bulb out/Curb Extension</li> <li>Pedestrian Countdown Signal</li> <li>Pedestrian Lead Interval</li> <li>No-Turn on Red Sign/Signal</li> </ul>	2 points: > 2 features per ped crossing  0 point: < 1 feature per ped crossing 1 point: 1 - 2 features per ped crossing
Intersection by Leg		<ul> <li>Bulb out/Curb Extension</li> <li>Pedestrian Countdown Signal</li> <li>Pedestrian Lead Interval</li> <li>No-Turn on Red Sign/Signal</li> </ul>	2 points: > 2 features per ped crossing  0 point: < 1 feature per ped crossing 1 point: 1 - 2 features per ped crossing 2 points: > 2 features per ped crossing  0 point: no ramps and no truncated tomes 1 point: ramps only, no truncated domes

Facility Type	Measure	Description/Feature	Scoring
Mid-block Crossing	1. Visibility		0 point: w/o high visibility crosswalk 2 points: with high visibility crosswalk
	2. Crossing Distance		0 point: no treatment 2 points: with bulb out or median pedestrian refuge
	3. ADA		0 point: no ramps and no truncated tomes 1 point: ramps only, no truncated domes 2 points: meet standard/requirement
	4. Traffic Control		0 point: no control 1 point: flashing beacon (In-pavement, RRFB, etc) 2 points: signal/pedestrian hybrid beacon (HAWK)
Maximum 8 points			

### **Pedestrian Safety**

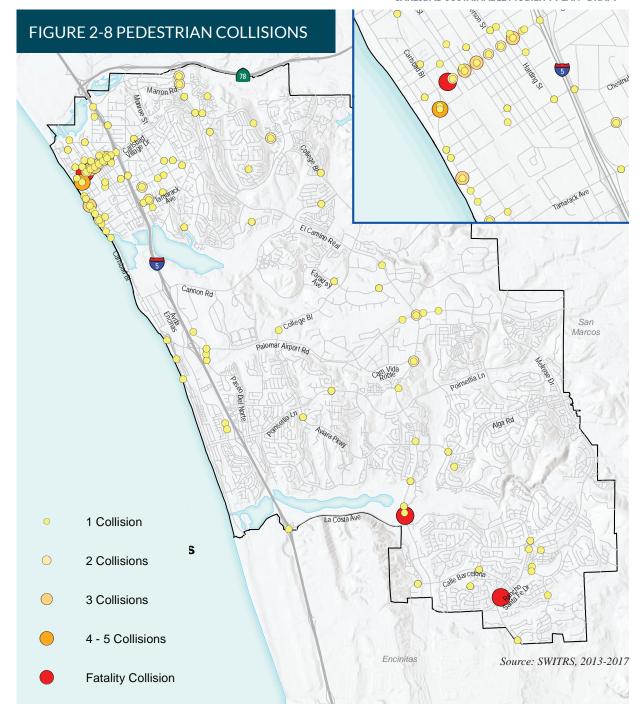
Pedestrian collisions are summarized by severity in Table 2-2. As shown, a majority of collisions, or 50.5%, resulted in "Other Visible Injury," meaning an injury that is visible but non-traumatic. This was followed by "Complaint of Pain," at 31.5% of all collisions. A total of eight pedestrian collisions, or 6.2%, were fatal.

Figure 2-8 displays the location of the pedestrian collisions across the City of Carlsbad. As can be seen, there is a high number of pedestrian collisions along Carlsbad Boulevard, as well as in the Carlsbad Village.

Table 2-2 Pedestrian Collisions by Severity of Type

Collision Severity	Collisions	Percent of Total
Other Visible Injury	65	50.5%
Complaint Of Pain	41	31.5%
Severe Injury	13	10.0%
Fatality	8	6.2%
Property Damage Only	3	2.3%
Total	130	100.0%

Source: SWITRS, 2013-2017



### Exhibit 1 EXISTING MOBILITY NETWORKS



A group of hikers on a Carlsbad Outdoor Recreational Trail

# CURRENT TRAIL CONDITIONS

Figure 2-9 shows the extensive network of existing trails in the City of Carlsbad.

Bringing together both pedestrian and bicycle networks, the trails map shows all of the existing connections that have been identified throughout the City of Carlsbad in the Carlsbad Draft Trails Master Plan.



Table 2-3 Centerline Mileage of Carlsbad Roadways by Speed

Roadway MPH	Centerline Miles	Percent of Total
20	24.4	7.0%
25	196.8	56.5%
30	17.4	5.0%
35	27.1	7.8%
40	29.2	8.4%
45	12.0	3.4%
50	20.0	5.7%
55	21.4	6.1%
Total	348.4	100.0%

## CURRENT CYCLING CONDITIONS

Caltrans currently recognizes four classifications of bicycle facilities, including Class I multi-use paths, Class II bicycle lanes, Class III bicycle routes and Class IV cycle tracks. A description and image of each of these facility types is provided to the right. Table 2-3 shows existing roadway mileage by speed in the City of Carlsbad. Depending on the posted speed limits, certain recommended bicycle facilities may be preferred over others. For instance a Class III facility would not be suitable for high-speed traffic, for there would be danger for both the cyclists and drivers. As shown in the table, the most common roadway has a posted speed limit of 25mph (56.5 %). About one-third of the city has a speed limit of 35mph or higher.



Class I Multi-Use Path – Also referred to as a bike path or shared-use path, Class I facilities provide a completely separated right-of-way designed for the exclusive use of bicycles and pedestrians with cross-flows by motorists minimized. The minimum paved width for a two-way multi-use path is considered to be eight-feet, with a two-foot wide graded area adjacent to the pavement.



Class II Bike Lane – Provides a striped lane designated for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited. Bike lanes are oneway facilities located on either side of a roadway. Pedestrian and motorist cross-flows are permitted. Additional enhancements such as painted buffers and signage may be applied. The minimum bike lane width is considered five feet.



Class III Bike Route - Provides shared use of traffic lanes with cyclists and motor vehicles, identified by signage and/or street markings such as "sharrows". Bike routes are best suited for low-speed, low-volume roadways with an outside lane of 14 feet or greater. Bike routes provide network continuity or designate preferred routes through corridors with high demand.



Class IV Cycle Track - Also referred to as separated bikeways, cycle tracks provide a right-of-way designated exclusively for bicycle travel within the roadway and physically separated from vehicular traffic. Cycle tracks can provide for one-way or two-way travel. Types of separation include, but are not limited to, grade separation, flexible posts, or on-street parking.



### Bicycle Network

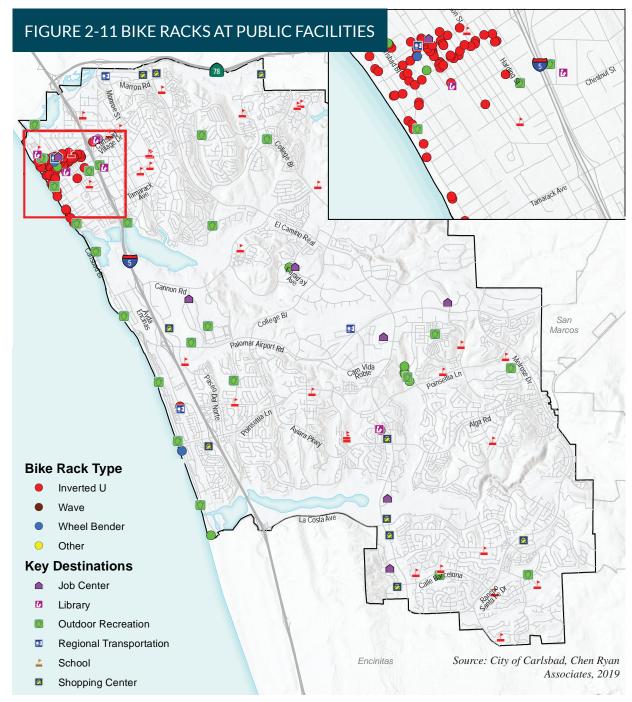
Figure 2-10 displays the location of existing bicycle facilities within the City of Carlsbad. As shown, the Carlsbad bicycle network is comprised of multi-use paths (Class I), bike lanes (Class II) and bike routes (Class III). Bicycle lanes comprise the majority of the network. There are 5.8 miles of multi-use paths in the City of Carlsbad.

Bicycle Facilities: Class I (top), Class II (left), Class III (right)









### **Bicycle Rack Inventory**

Figure 2-11 is a bicycle rack inventory at public facilities in the City of Carlsbad. The map displays the type of bicycle rack at each of the key destinations. As shown many bicycle racks are concentrated in the Village. The most common bicycle rack type found at outdoor recreation sites is the "wave" bicycle rack.



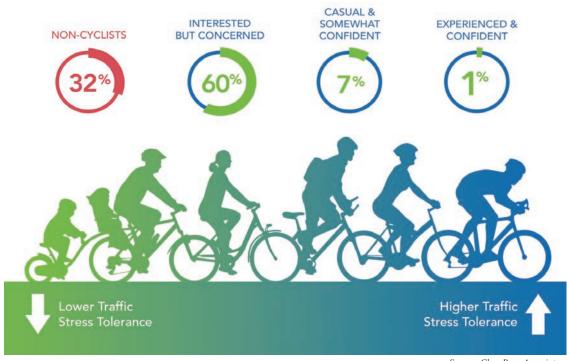
A typical Inverted-U Bike Rack found in the Carlsbad Village

### Quality of the Bicycle Network

The quality of the bicycle environment was assessed using the bicycle Level of Traffic Stress (LTS) methodology as developed by Mekuria, et al. (2012) of the Mineta Transportation Institute and reported in Low-Stress Bicycling and Network Connectivity. LTS classifies the street network into categories according to the level of stress it causes cyclists, taking into consideration a cyclist's physical separation from moving vehicles, vehicular traffic speeds along the roadway segment, number of travel lanes and factors related to intersection approaches with dedicated right-turn lanes and unsignalized crossings.

A visual depiction of the Four Types of Cyclists is shown to the right. The first category, the "Non-Cyclists", are people who, for a variety of reasons, would never get on a bicycle. About 32% of the population identifies with this category. The second category, the "Interested But Concerned," are people who would like to ride their bike, but are cautious. This category of cyclist prefers facilities that have little traffic stress. Approximately 60% of the population falls into this category. As the largest category, this is the category which is taken into consideration when recommending and

### Types of Cyclists



Source: Chen Ryan Associates

designing facilities. The third category is referred to as "Causal and Somewhat Confident" category, which approximately 7% of the population falls into. The final category is referred to as the "Experienced & Confident"; these are the cyclists who are willing to ride their bicycles regardless of the facility type, which makes up 1% of the population.



Figure 2-12 displays the bicycle Level of Traffic Stress for all roadways and paths where cyclists are permitted. Table 2-4 displays the key LTS inputs and criteria. As shown, roadways in the City of Carlsbad predominantly exhibit characteristics of LTS 1/2 or 4 environments. Roadways with an LTS 1 or 2 environment are generally residential streets and collectors, and considered high quality cycling environments. These types of roadways are generally characterized as having one lane in each direction while providing adequate width for cyclists and vehicles, with a low posted speed.

A number of roadways in the city offer an LTS 3 environment. In these cases, speed limits, vehicular volumes and roadway widths were sufficient to garner an LTS score which has room for improvement relative to most roadway conditions in the city, but would still not be deemed comfortable enough for an average cyclist.

Table 2-4 LTS Classification

LTS Category	LTS Description	Description of Environment	Comfort Level
LTS 1	Presenting little traffic stress and demanding little attention from cyclists; suitable for almost all cyclists, including children trained to safely cross intersections.	<ul> <li>Facility that is physically separated from traffic or an exclusive cycling zone next to a slow traffic stream with no more than one lane per direction</li> <li>A shared roadway where cyclists only interact with the occasional motor vehicle with a low speed differential</li> <li>Ample space for cyclist when alongside a parking lane</li> <li>Intersections are easy to approach and cross</li> </ul>	Interested but Concerned – Vulnerable Populations
LTS 2	Presenting little traffic stress but demanding more attention that might be expected from children.	<ul> <li>Facility that is physically separated from traffic or an exclusive cycling zone next to a well-confined traffic stream with adequate clearance from parking lanes</li> <li>A shared roadway where cyclists only interact with the occasional motor vehicle (as opposed to a stream of traffic) with a low speed differential</li> <li>Unambiguous priority to the cyclist where cars must cross bike lanes (e.g. at dedicated right-turn lanes); design speed for right-turn lanes comparable to bicycling speeds</li> <li>Crossings not difficult for most adults</li> </ul>	Interested but Concerned – Mainstream Adult Populations
LTS 3	Presenting enough traffic stress to deter the Interested but Concerned demographic.	<ul> <li>An exclusive cycling zone (lane) next to moderate-speed vehicular traffic</li> <li>A shared roadway that is not multilane and has moderately low automobile travel speeds</li> <li>Crossings may be longer or across higher-speed roadways than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians</li> </ul>	Enthused & Confident
LTS 4	Presenting enough traffic stress to deter all but the Experienced & Confident demographic.	<ul> <li>An exclusive cycling zone (lane) next to high-speed and multilane vehicular traffic</li> <li>A shared roadway with multiple lanes per direction with high traffic speeds</li> <li>Cyclist must maneuver through dedicated right-turn lanes containing no dedicated bicycling space and designed for turning speeds faster than bicycling speeds</li> </ul>	Experienced & Confident



### Bicycle Safety

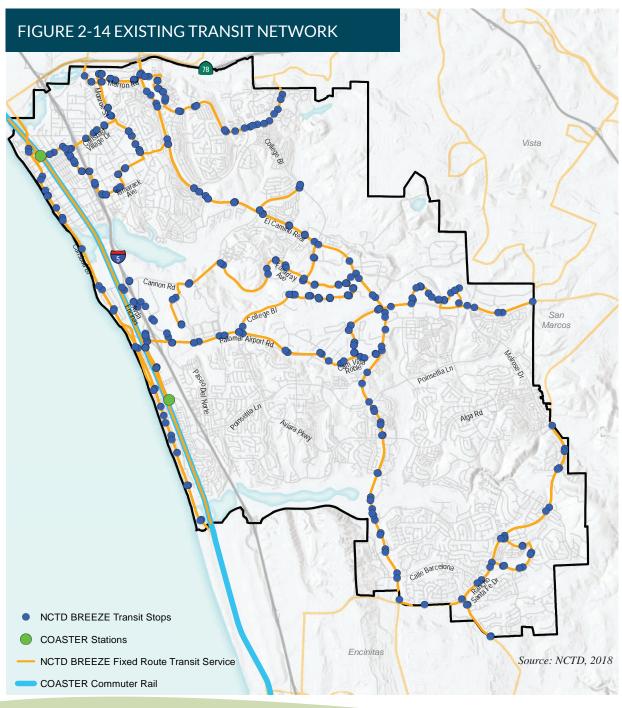
Bicycle collisions are summarized by severity in Table 2-5. As shown, a majority of collisions resulted in "Other Visible Injury" at 61.6% of all collisions, followed by "Complaint of Pain" at 25.3% of all collisions. Three bicycle collisions were fatal, or 1.6% of all collisions.

The bicycle collision locations are displayed in Figure 2-13. There is a high concentration of bicycle collisions along Carlsbad Boulevard as well as in and around the Village. Three bicycle involved collisions resulted in fatalities and took place on Carlsbad Boulevard, El Camino Real and Rancho Santa Fe Drive.

Table 2-5 Bicycle Collisions by Severity Type

Collision Severity	Number of Collisions	Percent of Total
Other Visible Injury	117	61.6%
Complaint of Pain	48	25.3%
Severe Injury	13	6.8%
Property Damage Only	9	4.7%
Fatality	3	1.6%
Total	190	100.0%

Source: SWITRS, 2013-2017

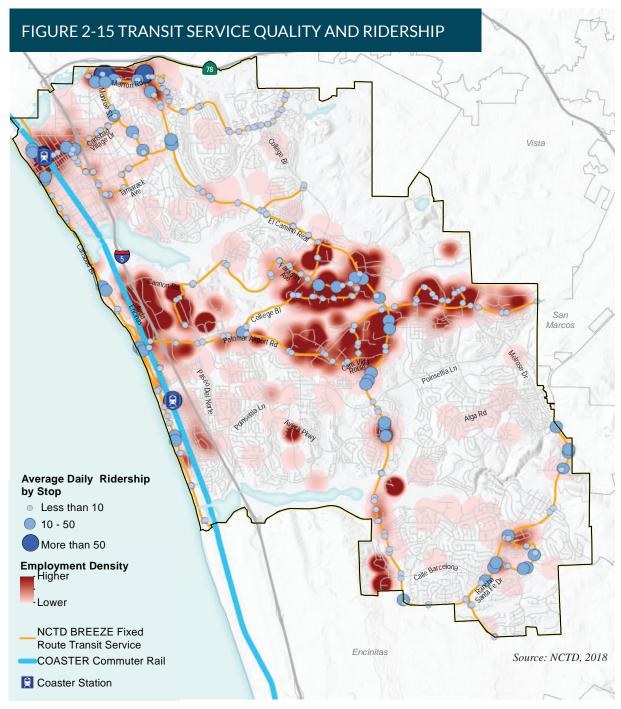


# CURRENT TRANSIT CONDITIONS

Figure 2-14 shows NCTD's BREEZE transit routes and stops. As shown, the majority of transit stops are along main arterial corridors, such as along El Camino Real, Palomar Airport Road, Faraday Avenue, Cannon Road and Tamarack Avenue. A higher concentration of stops occur along the coastal and business corridors.

The NCTD Coaster serves two locations in Carlsbad, at the Carlsbad Village Coaster Station and the Poinsettia Coaster Station. The NCTD Coaster serves the Carlsbad Village Coaster and Poinsettia stations between 5am and 11:20am on weekday mornings in the southbound direction, and between 7:00am and 10:20am on weekday mornings in the northbound direction. In the afternoon, southbound service runs from 2:45pm to 5:55pm, and northbound service runs from 2:45pm to 8:15pm.

There are four southbound trains departing from the Carlsbad Village Coaster and Poinsettia Coaster stations on weekends and holidays (two in the morning and two in the afternoon), and four northbound trains.



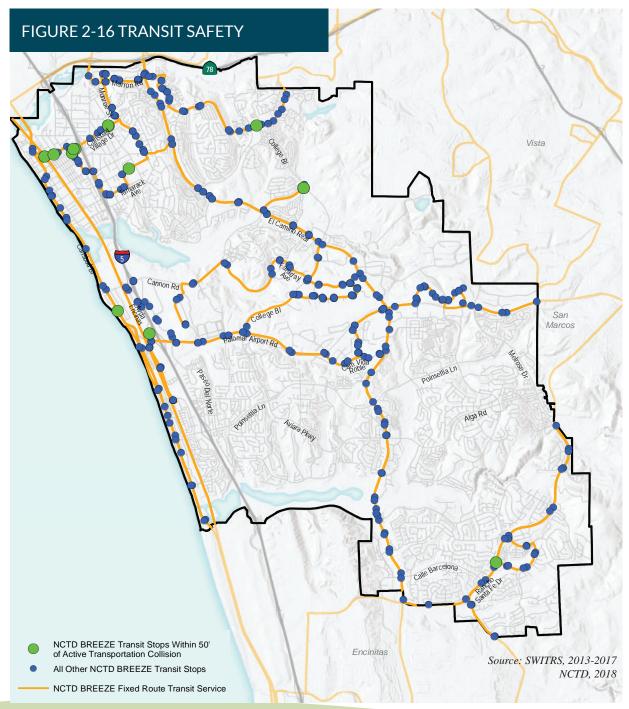
### Transit Service Quality and Ridership

Figure 2-15 shows the NCTD Breeze's average daily ridership in relation to City of Carlsbad employment density. Transit ridership appears fairly strongly correlated with employment density. Of particular note is the high employment density in the central portion of Carlsbad spanning from west to east, roughly between Cannon Road and Palomar Airport Road. Transit service connecting between these employment rich areas and the residential areas across the City of Carlsbad is an important consideration for future recommendations.

Average daily boardings and alightings at the Carlsbad Village Coaster station are approximately 78 per day (41 boardings and 37 alightings); while Poinsettia Village Coaster station has about 335 average daily riders per day with approximately 175 boardings and 160 alightings.



NCTD's Breeze Commuters



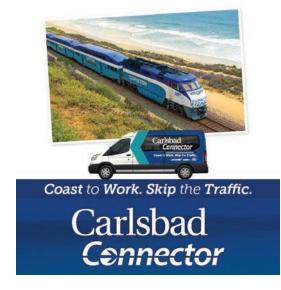
### **Transit Safety**

Figure 2-16 shows the bicycle and pedestrian-involved (active transportation) collisions within fifty feet of NCTD Breeze's bus stops. As shown, there is a concentration of active transportation collisions in the Village and Barrio neighborhoods. However, there are instances of active transportation collisions within fifty feet of the bus stops that have occurred throughout the city.

A total of 15 collisions occurred near transit stops between 2013-2017.



NCTD's Breeze Fixed Route Transit Service



### CARLSBAD CONNECTOR

The Carlsbad Connector is an on-demand shuttle service that transports commuters between the Poinsettia COASTER station and workplaces in Carlsbad. As the first program of its kind in San Diego County, the proof of concept service is designed to provide increased COASTER ridership by providing a flexible and convenient solution to bridge the gap between the station and the city's business parks.

The innovative project is operated by a partnership with the City of Carlsbad, North County Transit District (NCTD) and the San Diego Association of Governments (SANDAG). The Carlsbad Connector

functions via a smartphone app, similar to ride hailing service apps. The basic shuttle service characteristics include the following:

- Morning service from 7-9 AM, capturing the 7:09AM and 8:36AM northbound COASTER trains
- Mid-day service from 9-3 PM, provides expanded service including the Village which allows commuters to visit local lunch spots and other commercial areas to run daytime errands.
- Afternoon service from 3-6
   PM delivers commuters to the southbound COASTER trains at 3:43PM, 5:21PM and 5:51PM
- Four 14-person shuttles, one of which is fully ADA compliant
- Shuttles are equipped with Wi-Fi- and each shuttle will hold up to two bikes
- The system creates virtual stops that drop-off riders within a five minute walk from their ultimate destination
- The software optimizes drop-offs such that if 12 people all request to go to the same location, they will be grouped together and a single vehicle

will go straight to that destination

- Customers can pay through the COASTER app
- Customers without access to smart phones may call in to reserve and pay for rides
- Customers with a COASTER monthly or day-pass will ride for free
- Individual rides are \$2.50 per ride, in alignment with North County Transit District fares
- Businesses can offer promotions to employees or customers and RideCo will bill businesses directly
- Data are shared with all three agencies to help determine if service or stops need to be changed and for planning the viability of long-term service
- The participating agencies have targeted an average of 100 new daily boardings and/or disembarkings, or an average of 50 new daily roundtrip riders on the COASTER train serving Pointsettia Station as a marker of success for the pilot project.

### **KEY DESTINATIONS CONNECTIVITY ANALYSIS**

This section presents a holistic assessment of how well key destinations across the city of Carlsbad are served by the pedestrian, bicycle, and transit networks. It attempts to identify whether any specific location across the city is underserved by sustainable networks. This information will subsequently be used in the prioritization process presented in the final chapter of this document. Eighty-one (81) key destinations were identified by city staff and community members during the existing conditions phase of this planning process. The destinations include tourist attractions. shopping centers, parks, beaches, schools and employment centers. Each key destination received a score based on its locational significance in relation to the region and to the city itself, as well as based upon how well it is served by pedestrian, bicycle and transit networks.

### **Accessibility Score =**

**Locational Significance** 

Locational **Significance** 

Transit Network Points + Bike Network Points + Pedestrian Network Points

**Locational Significance** 

Each destination was assigned an accessibility score based on the formula above, which considers the destination's locational significance within the city and how well the destination is served by pedestrian, bicycle and transit networks. The accessibility score calculation results in higher values being assigned to destinations that are under-served by the networks, so that nearby projects emerge with higher implementation priority. The locational significance input recognizes that not all sites are equally significant as attractions. The point values in this formula are structured to require more significant locations be better served by the three networks (a higher numerator) than less significant locations.

Each input to the accessibility score calculation is described below.

### Assigning Locational Significance to Key Destinations

The key destinations were categorized into a hierarchy of three groups, with the following point values assigned:

- Regionally-significant (1 point) 12 destinations
- Jurisdictionally-significant (2 points) -22 destinations
- Neighborhood-serving (3 points) 47 destinations

### Key Destination Interface with Modal Networks

Each key destination was assigned point values according to how closely the destination interfaced with pedestrian, bicycle and transit networks. The points were awarded as follows:

Pedestrian Network Points (see Figure 2-17)
To assess how well a key destination is served by the existing pedestrian network, the following points were awarded to the destination if an existing sidewalk facility was:

- adjacent to key destination (0 points)
- not existing adjacent to key destination (2 points)

Bicycle Network Points (see Figure 2-18)
To assess how well a key destination is served by the existing bicycle network, the following points were awarded to the destination if a bike lane or separated bicycle facility was:

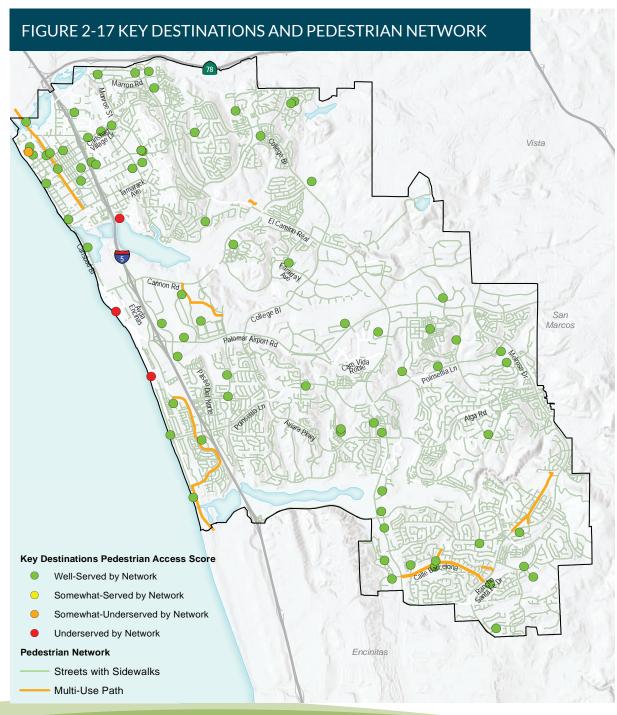
- adjacent to key destination (0 points)
- within 0.25 miles of key destination (0.5 points)

- between 0.25 miles and 0.5 miles of key destination (1 point)
- beyond 0.5 miles of key destination (2 points)

Transit Network Points (see Figure 2-19)
To assess how well a key destination is served by the existing transit network, the following points were awarded to the destination if a transit stop was:

- adjacent to key destination (0 points)
- within 0.25 miles of key destination (0.5 points)
- between 0.25 miles and 0.5 miles of key destination (1 point)
- beyond 0.5 miles of key destination (2 points)

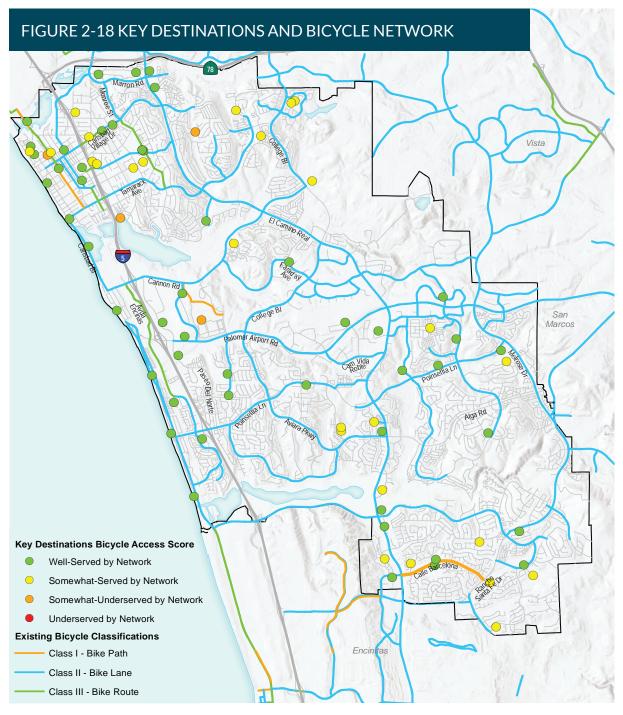
Figures 2-17 through 2-19 show the key destinations and their respective pedestrian access scores, bicycle access scores and transit access scores. The "access" scores were calculated by dividing the respective network-specific points for each key destination by its locational significance.



### **Pedestrian Access**

As shown in Figure 2-17, almost all key destinations across the City of Carlsbad are well-served by the current pedestrian network, with the exception of the following:

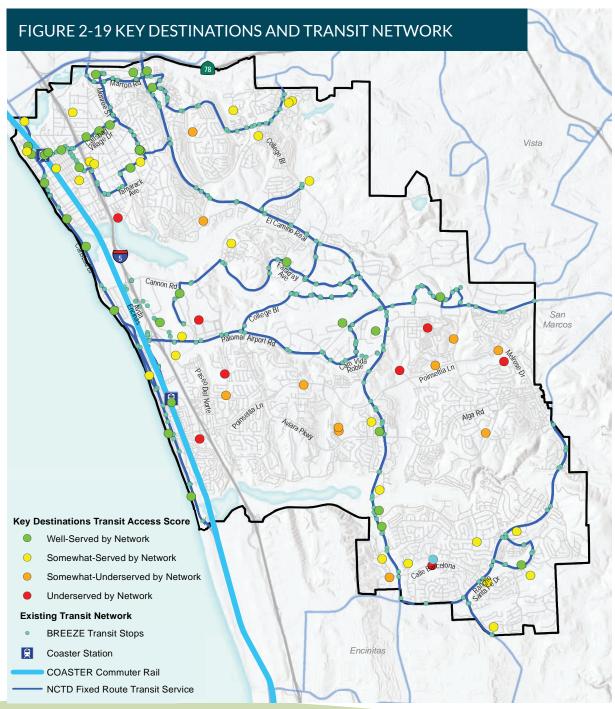
- Samuel Warfield Peterson Library & Information Center
- Agua Hedionda Trailhead
- Terramar Beach
- Canyon de la Encinas Beach



### **Bicycle Access**

As shown in Figure 2-18, almost all key destinations are either well-served or somewhat-served by the existing bicycle network. The following key destinations are somewhat-underserved by the bicycle network:

- Carlsbad Village Coaster Station
- Hidden Canyon Community Park
- Agua Hedionda Trailhead
- Legoland



### **Transit Access**

Figure 2-19 shows that eight key destinations are underserved by current transit network:

- Agua Hedionda Trailhead
- Legoland
- Poinsettia Park
- Poinsettia Village Plaza
- Bressi Ranch
- Alga Norte Community Park
- Leo Carrillo Ranch Historic Park
- San Dieguito Sports Complex

Figure 2-19 also shows that 11 key destinations are somewhat underserved:

- Hidden Canyon Community Park
- Laguna Riveria Community Park
- Pacific Rim Elementary
- Redeemer by The Sea Lutheran Preschool
- Aviara Oaks Middle School
- Aviara Oaks Elementary School
- Pacific Ridge School
- Poinsettia Elementary School
- Carillo Elementary School
- La Costa Meadows Elementary School
- La Costa Valley Preschool

### **KFY FINDINGS**

### Pedestrian

Most of the streets in the City of Carlsbad that are programmed for sidewalks have sidewalks present. The overriding issue for people walking is the curvilinear nature of the street network, which limits direct connectivity to adjoining land uses. In addition, the streets that connect land uses are typically high-speed, high-volume vehicular arterials, with long block lengths and generally disconnected walking environments, despite the presence of cosmetic amenities such as planting strips, and adequate sidewalks.

The auto-oriented street network and land use mix limits the attractiveness of walking for transportation in all but a few selected locations in the city. Retrofitting arterials to facilitate crossings for students, the elderly and other vulnerable users will require careful consideration of the Mobility Element's guiding principles.

In addition, intersections citywide may need to be upgraded when feasible to improve visibility and conflicts with turning vehicles and other high-frequency collision behaviors.

### **Trails**

The City of Carlsbad has a citywide Trails Program, which creates a connected and complete trails system, accommodates a variety of trail users in a safe and environmentally sensitive manner, seeks to identify existing and future trail development and integrates transportation related facilities as part of the trails system.

### **Bicycles**

As with the conditions present for people on foot, people on bicycles suffer from a lack of practical connections between areas of the city. While the city maintains an extensive network of bicycle facilities, these facilities are often present alongside high-speed and high-volume vehicular arterials, and lack physical protections for people bicycling, which discourages all but the most confident users of the network.

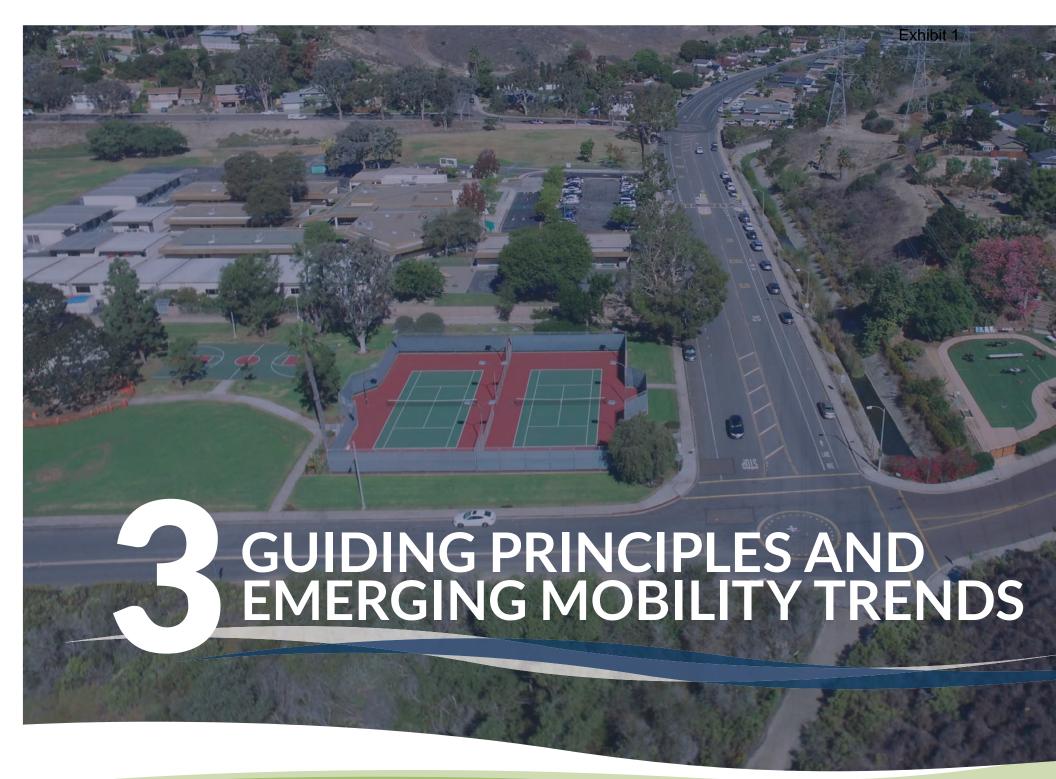
An exception to this can be found in Carlsbad Village, which features a number of low-speed and connected streets, and a completed section of the Coastal Rail Trail, all of which are appealing places to ride and represent excellent opportunities for shifting travel modes away from vehicles to bicycles when conditions are comfortable and perceived as safe by the user.

### Transit

A significant constraint for people using transit is the lack of connection between the employment centers located along College Boulevard, Faraday Avenue, El Camino Real and Palomar Airport Road and the COASTER Stations. Lack of travel times competitive with private automobiles, lack of transfer locations and lack of amenities at fixed route stops present significant barriers to attracting "choice" riders to the network and the resultant improvements in vehicle miles traveled metrics, greenhouse gas emission reductions and other benefits.

Recent city initiatives will provide a policy framework for the development of Transportation Demand Management strategies to assist in the efforts of the public and private sectors to better connect job sites and other key destinations, and should be developed alongside improvements to other modes to encourage seamless connections for transit riders throughout the City of Carlsbad.

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# GUIDING PRINCIPLES AND EMERGING MOBILITY TRENDS

This chapter sets forth guiding principles for the SMP's recommendations. These principles are largely focused on ensuring equitable access and safely to all modes of travelers regardless of age or physical ability. Key principles embraced in the SMP's recommendations include the "8 to 80" Network, Safe Walking and Cycling Routes and Moving Beyond Planning for Commute Trips. In addition to these guiding principles, it was important during the SMP planning process to integrate consideration of several important emerging mobility trends.

### **GUIDING PRINCIPLES**

### "8-to-80" Networks

An "8-to-80" city reflects the potentially specialized needs of eight- and eighty-year-old members of the community when planning. The intent of this approach is to produce planning outcomes that ensure a city functions properly and equitably for everyone's ability. Generally, the past 50 years has produced planning outcomes for North American cities that prioritize driver-based mobility.

Car-centric planning oftentimes neglects mobility for those who may be not be able to operate a motor vehicle, such as seniors and children. Among other outcomes, this approach can result in a reduction of much of life's daily physical activity. The 8-to-80 approach shifts the focus back to people, and aims to create healthier and more equitable cities supported by safe mobility infrastructure that accommodates all modes of travel.

### IN THIS CHAPTER

 Summary of guiding planning principles and emerging mobility concepts to consider when developing future mobility networks for the City of Carlsbad The City of Carlsbad has taken strides to ensure that all ages and abilities have access to what the city has to offer, particularly with respect to recreation. Moving forward, it will be beneficial to ensure that portions of the city characterized by typical twentieth-century suburban patterns of development are properly considered for retrofits that encourage and accommodate non-vehicular mobility. Maintaining a frame of reference for users limited to certain types of personal mobility, such as children and seniors, works toward fostering an inclusiveness to all who live, play or work in the City of Carlsbad.

An "8-to-80" city focuses on making its city more engaging and vibrant for its residents. This includes creating public spaces, building safe and connected walking and bicycling infrastructure, lowering traffic speeds, mixing land uses and investing in public transportation. Specifically this includes ensuring that the sidewalk network is in good condition and continuous, that there are ADA-compliant curb ramps which allow for residents in wheelchairs or other mobility devices to easily cross the street and get back on the sidewalk, as well as placing curb extensions at intersections to shorten the crossing distance. The focus of "8-to-80" cities was on creating a welcoming public realm by including street trees and

comfortable seating, in addition to other amenities.

Additional detail on the features of an "8-to-80" network can be found in the Design

Guidelines of this Plan.

### Safe Walking and Cycling Routes

The Safe Routes to School Program concept began in Denmark in the 1970s. Since that time, cities across the U.S. have developed



"8 to 80" friendly environment, street trees in a walkable neighborhood of Carlsbad (the Village)

and implemented programmatic and infrastructure changes to facilitate children walking and cycling to and from school. Safe Route programs have also sprung up for seniors, for transit stops and for parks.

### Safe Routes to School

Helping children walk and bicycle to school is good for children's health and can reduce congestion, traffic dangers and air pollution caused by parents driving children to school. Robust Safe Routes to School programs address the six E's(Engineering, Education, Encouragement, Enforcement, and Evaluation and Equity). Chapter Six includes more information about Safe Route programs.

#### Safe Routes for Seniors

A Safe Routes for Seniors program targets pedestrian improvements in areas with senior centers, a large number of senior residences and other facilities such as hospitals and clinics. The benefits of creating a Safe Routes for Seniors programs include allowing seniors to remain independent by giving them the option to get around on foot and creating a safer walking environment for everyone using the streets.

### Safe Routes to Parks

Safe Routes to Parks aims to increase the

number of people who have safe access to parks. By creating the opportunity for safe walking and biking trips to the park, motorized trips are decreased. The result of this switch is a reduction in carbon emissions throughout the city.

### **Moving Beyond Commuting Trips**

The typical single-family household in the San Diego region generates approximately 10 trips per day for work, school, errands, recreation and other uses. Historically, the focus of planning efforts has been on improving conditions for only about 20% of those trips, or those occurring between home and work during the traditional peak periods.

This was done in large part because planners were unable to evaluate usage rates, patterns and distribution of the remaining 80% of trips due to poor reporting and counting methodologies.

New perspectives on travel choices, as noted in the section on "8-to-80" networks above, are more inclusive and acknowledge that a typical household makes many types of trips each day. The City of Carlsbad's Climate Action Plan identifies a number of trip reduction strategies designed to mitigate climate impacts from vehicle trips, amounting to a roughly five percent reduction from

Table 3-1 Total Daily Trips by Land Use Type in the City of Carlsbad

211/ 21 231112			
	Daily	Percent	
Land Use	Trips	of Total	
Single Family	207,629	24.1%	
Neighborhood			
Commercial	117,898	13.7%	
Street-Front Commercial	104,546	12.1%	
Multi-Family	76,981	8.9%	
Industrial Park	72,796	8.4%	
<b>Community Commercial</b>	64,896	7.5%	
Low-Rise Office	37,658	4.4%	
Service Station	27,580	3.2%	
Elementary School	15,080	1.7%	
Auto Commercial	12,818	1.5%	
Active Park	12,144	1.4%	
Government Office or			
Center	11,140	1.3%	
Senior High School	10,593	1.2%	
Junior High or Middle School	10,214	1.2%	
Light Industry	8,812	1.0%	
Mobile Home Park	8,359	1.0%	
Other Recreation-High	5,994	0.7%	
Low-Rise Hotel or Motel	5,985	0.7%	
Other Health Care	5,224	0.6%	
Post Office	5,088	0.6%	
Resort	4,651	0.5%	
Church	4,237	0.5%	
Other Commercial	3,816	0.4%	
Regional Commercial	3,407	0.4%	

The neighborhood in this photo produces over 100 daily trips. Strategies for trip reduction should consider all of the places residents travel to and from.



Table 3-1 Total Daily Trips by Land Use Type in the City of Carlsbad (continued)

Land Use	Daily Trips	Percent of Total
Passive Beach	3,228	0.4%
Active Beach	3,196	0.4%
Other Public Service	2,967	0.4%
	2,967	0.3%
Other Transportation	,	0.070
Fire or Police Station	1,905	0.2%
Junkyard/Dump/Landfill	1,572	0.2%
Other School	1,384	0.2%
Warehousing	1,335	0.2%
Golf Club House	996	0.1%
Other Recreation-Low	854	0.1%
Public Storage	730	0.1%
School District Office	683	0.1%
Communication or Utility	623	0.1%
Under Construction	504	0.1%
Other Group Quarters	475	0.1%
Wholesale Trade	462	0.1%
Field Crops	321	0.0%
Intensive Agriculture	226	0.0%
Parking	170	0.0%
Right-Of-Way	120	0.0%
Orchards Or Vineyard	100	0.0%
Extractive Industry	54	0.0%
Inactive Use	40	0.0%
Golf Course	14	0.0%
Residential Recreation	6	0.0%
Cemetery	3	0.0%
Grand Total	861,804	100%

current estimates.

Using trip generation rates for city land uses developed by the San Diego Association of Governments (SANDAG) as part of their regional modeling efforts (Series 13), the following estimates of trips by each category of land use in the City of Carlsbad was developed. (See Table 3-1)

Furthermore, analyses have shown that roughly 40% to 50% of all trips originating in the City of Carlsbad are less than two miles in length. These short trips could very well be made by bike.

In order to help the City of Carlsbad meet its Climate Action Plan goals, a focus on tripreduction and trip-replacement strategies specific to respective land uses, particularly schools, housing and key destinations such as beach and park access points rather than simply focusing on general work trips is a strategy worth exploring — chiefly through the emphasis on providing safe and competitive alternatives to driving.

### Bicycle Friendly Community Designation

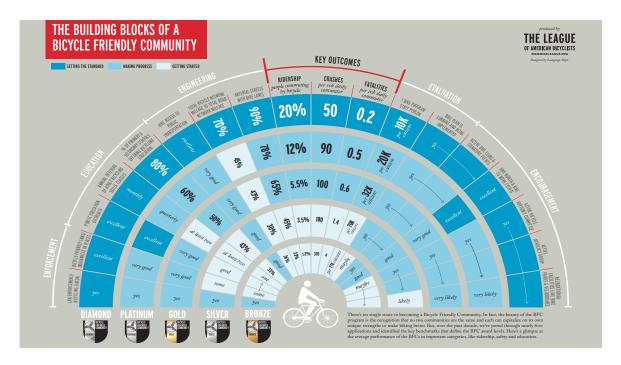
In spring 2015, the City of Carlsbad applied to be recognized as a "Bicycle Friendly Community (BFC)" by the League of American Bicyclists. This designation indicates a community's commitment to bicycling infrastructure, programs and other initiatives designed to increase the safety,

comfort and transportation options for people on bicycles.

While not selected for BFC status at that time, the following recommendations were provided. As shown below, the City of Carlsbad has made strides in several categories since 2015:

### **Engineering**

- Adopt a Complete Streets policy and offer implementation guidance.
   Completed
- Adopt bicycle facility selection criteria that increases separation and protection of bicyclists based on levels of motor vehicle speed and volume.
   Underway
- Develop a design manual that meets current NACTO standards or endorse the NACTO Urban Bikeway Design Guide. Underway
- Adopt standards for bike parking that conform to APBP guidelines. Underway
- Continue to expand the bike network, especially along arterials, through the use of different types of bicycle facilities. On roads where automobile speeds regularly exceed 35 mph, it is recommended to provide separated bicycle infrastructure such as cycle tracks, buffered bike lanes or parallel



10ft wide shared-use paths (in low density areas). **Underway** 

### **Education**

- Continue to expand the public education Bike+Walk Carlsbad campaign. Underway
- Work with the local bicycle groups or interested parents to develop and implement a Safe Routes to School program for all schools. Underway
- Offer regular bicycling skills training opportunities for adults Underway

- Expand encouragement efforts during Bike Month. Underway
- Encourage local businesses, agencies, and organizations to promote cycling to their employees and customers and to seek recognition through the Bicycle Friendly Business program. Underway
- City government should be the model employer for local businesses, and the Chamber

of Commerce or local business association can help promote the program and its benefits. **Underway** 

### **Enforcement**

- Police officers should be initially and repeatedly educated on traffic law as it applies to bicyclists and motorists.
   Underway
- Adopt fair and equitable traffic laws.
   Underway

### **Evaluation & Planning**

- Appoint an official Bicycle Advisory Committee (BAC) to create a systematic method for ongoing citizen input into the development of important policies, plans and projects. Underway
- Ensure the ongoing implementation of the bicycle master plan. Underway
- Expand efforts to decrease the number of crashes involving a bicyclist. Underway

## EMERGING MOBILITY TRENDS

#### **Mobility Hubs**

Mobility hubs are places of connectivity where different modes of travel – walking, biking, transit and shared mobility – converge and where there is a concentration of employment, housing, shopping and/or recreation. They provide an integrated suite of mobility services, amenities and technologies to bridge the distance between high-frequency transit and an individual's origin or destination. They also serve as a destination in their own right, where many trips may end or where errands may take place.

Sample mobility hub services, amenities and technologies include bikeshare, carshare, neighborhood electric vehicles, bike parking, dynamic parking management strategies, real-time traveler information, ridesharing, microtransit services, bike and pedestrian improvements, wayfinding and urban design enhancements. These features help travelers connect to regional transit services and make short trips within the neighborhood and beyond. Integration of information technology helps travelers find, access and pay for transit and on-demand shared

mobility services. In the future, automated and connected transportation services may enhance mobility for travelers of all ages and abilities while fostering a safer environment for all mobility hub users.

As part of the fulfillment of San Diego Forward: The Regional Plan, SANDAG has developed a Regional Mobility Hub Strategy to demonstrate how transportation services, amenities and supporting technologies can work together to make it easier for communities to access transit and other shared mobility choices.

Four potential locations for Mobility Hubs have been identified in the City of Carlsbad: the existing Poinsettia and Village Coaster stations, the Shoppes at Carlsbad/Plaza Camino Real shopping center and in the business park area adjacent to Palomar Airport Road.

Additional detail on this topic, as well as an evaluation of each site's suitability and potential



Example Mobility Hub Services (source: SANDAG)

features, is found later in Chapter Five.

#### **Emerging Mobility Analysis Tools**

The practice of evaluating vehicle traffic operations has existed more or less since the invention of the automobile. Known as "level of service," the evaluation centers primarily on the functional capacity of an existing roadway to move vehicles efficiently.

In the 21st century, traffic engineers nationwide, as well as in the City of Carlsbad, have developed a number of additional criteria to comprehensively evaluate the public right-of-way for all users.

Brief descriptions of these techniques can be found below, and additional analyses conducted within the City of Carlsbad can be found in the draft Existing Conditions Report and provided in Appendix A.

Examples of these methodologies include:

 Multi-Modal Level of Service (MMLOS), City of Carlsbad: Aims to determine level of service for all users, not just vehicles. A high score indicates a balance between drivers, pedestrians, bicyclists and transit options. A low score tips the scale in favor of the traditional vehicle-centric roadway environment.

- Pedestrian Level of Service (PLOS).
   <u>City of Carlsbad</u>: Quantifies sidewalk dimensions and traffic volumes. This method values wide and comfortable sidewalk conditions favorably; and values constricted, high traffic conditions less favorably. A wide sidewalk on a residential street receives a high score, whereas a busy roadway with no sidewalks receives a low score.
- Pedestrian Environment Quality Evaluation (PEQE), Chen Ryan Associates: Examines pedestrian conditions qualitatively. This method takes into consideration such factors as pedestrian obstructions, lighting, vehicle speeds and vehicle/pedestrian separation. Sidewalks that are comfortable to walk on for all people and times of day receive high scores, and sidewalks that are difficult to walk on comfortably receive low scores.
- Bicycle Level of Service (BLOS)

   and Roadway Dimensions, City of Carlsbad:
   Quantifies the quality of bikeways based upon roadway dimensions and traffic volumes.

   This method values greater physical separation between bikes and

- vehicles, and values close, high traffic conditions less favorably. Bikeways that have more space from less vehicles maintain higher scores, whereas bikeways with little to no separation from high vehicle volumes maintain lower scores.
- Level of Traffic Stress (LTS). Chen Ryan Associates: Qualitatively examines the comfort of bicycling for all users. This method scores roadways based on suitability for different types of cyclists. A low traffic stress score (LTS 1) is a comfortable roadway condition for all users. A high traffic stress score (LTS 4) is only suitable for confident and experienced cyclists.
- Walkability Index: The Walkability
  Index is a quantitative tool used to
  measure the pedestrian environment
  within a geographic area to
  determine the degree to which it
  may be considered safe, comfortable,
  accommodating or useful to the
  pedestrian.

These indexes can be used to promote walkable neighborhoods by creating the ability for one to identify the degree to which certain features, such as sidewalk

installation, gap closure, amenities, or access to services, would improve "pedestrian-ism" in a community.

Walkability Indexes often utilize a 0-100 scale, ranking locations or nodes from being highly car-dependent at the low end, to allowing full independence on foot at the high end. Scores are determined through distance to amenities using the roadway network, whereby increased distance yields a lower score.

A popular Walkability Index is WalkScore (www.walkscore.com), which is commonly used in real estate listings, and has been used in wayfinding signage for pedestrianoriented districts, including the City of Pasadena's Old Town District.



Example shipping truck services used in the city



Walkability Score

## Rideshare and Transportation Network Companies (TNC's)

Transportation Network Companies (TNCs) such as Uber and Lyft use online platforms to connect passengers with drivers. Drivers for TNCs use their own personal vehicles. TNCs are one of the most recognized forms of shared mobility. Ridesharing involves adding additional passengers to a trip that will already take place. Types of ridesharing include carpooling, vanpooling and real-time or dynamic online ridesharing services.

Uber Pool and Lyft Line allow TNC drivers to add additional passengers to a trip in real time. This type of service is known as "ride-splitting" since it allows the passengers to split the cost of the trip. This is an area of continued innovation as companies experiment with other services.

Due to the nature of these trips – the driver drops passengers off at the curb – there is a need to manage high-volume pick-up and drop off locations, as well as manage high-volume pick-up and drop off periods. Examples of this include defining areas where passengers can be picked-up and/or dropped off at the beach or curbside in front of a concert venue before and after a concert.

## Shared Mobility Devices (bikeshare and e-scooters)

Bikeshare and electric scooter share are components of the increasingly diverse shared mobility landscape. Bikeshare companies provide a pool of bicycles that are available for short-term rental. Bikeshare comes in a variety of forms, including dockbased and dockless systems, as well systems which are available to anyone who downloads the online application or restricted to



A typical TNC service used for a variety of different trips

members of the service. The fees for use are assessed either on a membership basis, on the length of time the bicycle has been used, the distance the bicycle was ridden or any combination thereof. Bikeshare systems can be comprised of traditional bicycles or electric bicycles.

A scooter sharing system is a service, similar to a bikeshare service, in which scooters are made available for short-term rental. Usually scooter share systems are available to anyone who downloads the online application, and has an initial unlocking fee and then charges based on the length of time the scooter is used.

As of 2019, the City of Carlsbad has elected not to participate in a regional bikeshare program, but will be monitoring the effort for potential implementation in the future.

## "Shared Use Cities" and Flexible Curb Space

Ridesharing via Transportation Network Companies ("TNC"s such as Uber, Lyft, etc.) and shared mobility devices are increasing the need for safe and efficient curbside access for passengers and drivers. In response to the growing competition for space, some cities are calling the curbside "flex space" and starting to be more intentional about defining curbside uses. Cities are attempting to increase the efficiency of curb space, including for those arriving by TNC, taxi, transit, private car drop-off, parked car or another mode that requires curbside access (e.g., bikeshare, motorcycle, etc.).

In future mobility considerations, the curb space can serve a variety of functions and users, including commercial loading which can be as important to users as often as passenger loading. Many cities and agencies are developing policies and frameworks in response to the changing needs and uses of curb space.



People with example Shared Mobility services

A brief discussion of potential flexible curb space locations and policy framework can be found in the Carlsbad SMP Complete Streets Design Guidelines in Appendix B.

#### Mobile Technology and "Big Data"

Perhaps no technology will have a greater role in the development of safe, efficient and adaptable transportation systems than the smartphone. Throughout the country, cities are embracing the innovation and ability to present, retrieve and collect information regarding how people move throughout their cities with the support of a smartphone.

While most people realize they can access real-time information on vehicle traffic conditions through smartphone applications, innovative cities are supplementing this information with comprehensive information for people walking and biking, including preferred routes to school, trail network connections, safety or bicycle maintenance tips, custom route maps and many other elements that have traditionally been paper-based or static exhibits lacking the location-specific benefits found in modern smartphones.

In addition to the benefits for residents and visitors, cities have begun to utilize anonymous location data provided by thirdparty providers in bulk to help evaluate trip patterns and maximize the efficiency of public spaces. These datasets can take the form of GPS-enabled e-scooter and bikeshare trip logs, heavy truck trip data, as well as passive, location-based service metrics such as location, time of day, trip start and trip end "hot spots" and trip speed. Using this data, cities can more effectively manage existing right-of-way to improve decision-making and increase the efficiency of transportation networks without incurring unnecessary and significant impacts such as roadway widening



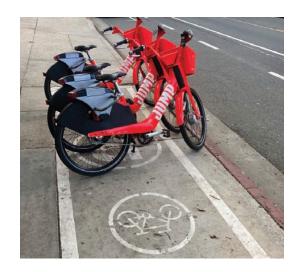
Electric scooters and e-bikes curb space

or other capital investments until absolutely necessary.

#### **F-Bikes**

E-bikes are bicycles equipped with electric motors that can either provide additional power to the user pedaling or move the bike without human assistance. Bicycle style e-bikes can be categorized into two types: powered bike (engine can generate thrust without the user pedaling) and electric assist bicycles (engine will only generate additional thrust when someone is pedaling).

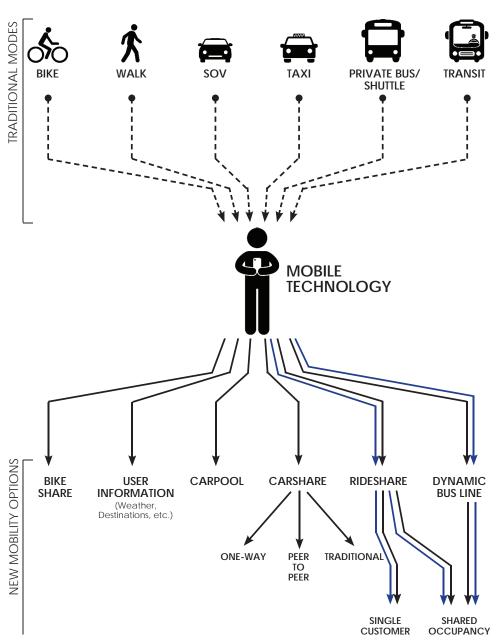
In California, E-bikes have been divided into three classes:



- Class 1 electric bicycles: A low-speed pedal-assisted electric e-bike. These bikes are equipped with a motor that provides assistance only when the rider is pedaling and ceases to provide assistance when the bicycle reaches 20 MPH.
- Class 2 electric bicycle: A low-speed throttle-assisted electric bicycle.
   These bikes are equipped with a motor that may be used exclusively to propel the bicycle and that is not capable of providing assistance when the bicycle reaches 20 MPH.
- Class 3 electric bicycle: A speed pedalassisted electric bicycle. These are equipped with a motor that provides assistance only when the rider is pedaling and that ceases to provide



Smartphone using a Bikeshare app



Source: Chen Ryan Associates, 2019

assistance when the bicycle reaches 28 MPH and is equipped with a speedometer. Class 3 electric bicycles shall not be operated on a bicycle path or trail, bikeway, bicycle lane, (more names for essentially the same thing), UNLESS it is adjacent to a roadway or

the local authority permits them by ordinance.

Conceptual guidance is provided in the graphic from the League of American Bicyclists below.

		VEHICLE			USER		BIKEWAY ACCESS				
		PEDAL Operated	MAXIMUM Motor-Assisted Speed (MPH)	MINIMUM AGE (YEARS)	DRIVER'S License	LICENSE Plate	HELMET	CLASS I Bike Path	CLASS II Bike lane	CLASS III Bike Route	CLASS IV Protected lane
	BICYCLE	YES	N/A	N/A	NO	NO	17 AND UNDER	YES	YES	YES	YES
	TYPE 1 E-BIKE	YES	20	N/A	NO	NO	17 AND UNDER	YES	YES	YES	YES
VEHICLE TYPE	TYPE 2 E-BIKE	NO	20	N/A	NO	NO	17 AND UNDER	YES	YES	YES	YES
	TYPE 3 E-BIKE	YES	28	16	NO	NO	YES	NO	YES	YES	NO
	MOPED	NO	N/A	16	YES	YES	YES	NO	YES	YES	NO

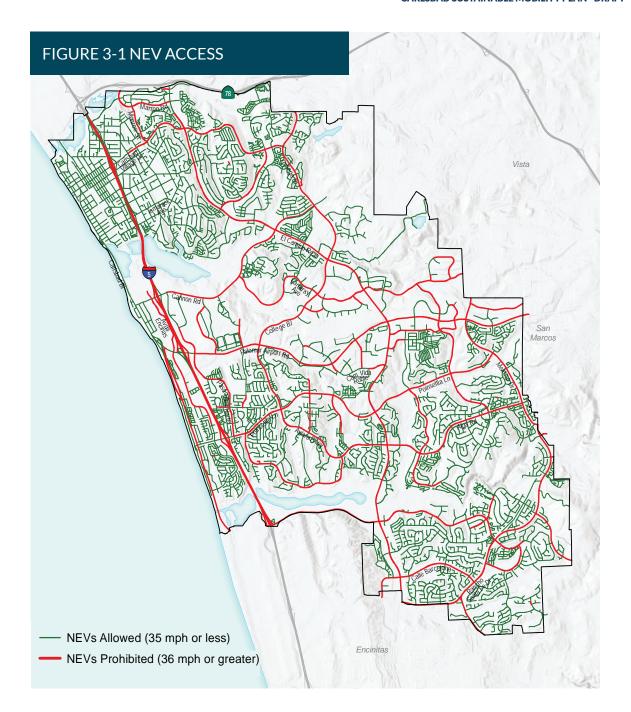
#### Neighborhood Electric Vehicles (NEVs)

Beginning in 2019, cities like the City of Carlsbad can develop specific NEV plans designed to optimize the use of NEVs as a viable mode of transportation. Because of the slow speed of NEVs and lack of safety features, routes of travel for NEVs are identified or designated that will make access in NEVs convenient, while protecting them from automobile traffic.

Neighborhood Electric Vehicles (NEVs) present unique opportunities and challenges to policy and infrastructure, as they often share space infrastructure with cars, and sometimes with bikes and other slow modes such as e-bikes and scooters. NEVs are a type with slow-speed, lightweight electric Local Use Vehicle (LUV). NEVs are limited to speeds up to 25 mph and may drive only on streets with speed limits up to 35 mph, as per the California Vehicle Code. NEVs can cross roads of speed limits greater than 35 mph if the crossing, controlled or uncontrolled, begins and ends on a street with speed limits less than 35 mph.

#### **California Regulatory Context**

The California Vehicle Code defines NEVs as a type of Low Speed Vehicle (LSV). The driver of an NEV must have a driver's license,



be insured in the same way as a driver of a full speed vehicle, and the vehicle has to be registered with the DMV and have a VIN number. Dealers of NEVs are required to warn buyers of the risks associated with driving a vehicle without safety features. NEVs need to conform to the safety standards set forth in the Federal Motor Vehicle Safety Standards governing the requirement for features such as seat belts and headlamps. If an NEV is modified to travel at a speed greater than 35 mph, then it is required to have all the safety equipment of a full speed vehicle.

Barring the few cases where a jurisdiction's NEV Plan is adopted as the result of an action by the state legislature, an NEV cannot travel on roads with speed limits above 35 mph. NEVs can cross roadways with a speed limit in excess of 35 miles per hour if the crossing begins and ends on a roadway with a speed limit of 35 miles per hour or less and occurs at an intersection of approximately 90 degrees. An NEV shall not traverse intersections without traffic controls (e.g. traffic lights, stop signs) with any state highway, unless that intersection has been approved and authorized by the agency having primary traffic enforcement responsibilities for that crossing.



Conceptual alignment of a slow-speed NEV lane
(Source: LA Metro)

A local police department with primary traffic enforcing responsibility, or the CHP, may prohibit the use of NEVs on any roads under their jurisdiction in the interest of public safety. Any such prohibition is made effective through signs upon the roadway.

#### **NEV Plans and Space Requirements**

Safe NEV routes can be established through a network of designated slow speed paths, lanes and routes on streets with speed limits up to 35 mph. Consideration of safe crossings is key to ensuring connectivity of the network. Specific signage is necessary for ensuring mobility and safety for NEV routes so drivers of NEVs understand where they should and should not go, and other drivers are also aware of the presence of NEVs.

Cities throughout California are adapting the Streets and Highway Code definitions of bicycle facilities to include provisions for NEVs as "Slow Speed" networks. Typically, this can be done within the design considerations of existing bikeways, although occasionally additional lane width is required to accommodate NEVs. Typical considerations are as follows:

- Class I Slow Speed Path Off street multi-use path, shared by all slow modes (recommended 14' width, 7' in each direction)
- Class II Slow Speed Lane Striped, dedicated on-street lane on 35+mph roads shared by on-street slow modes (recommended minimum of 7' width using existing bicycle lanes)
- Class III Slow Speed Route Shared by all on-street modes (recommend using existing 10-12' general purpose travel lanes). Segments would ideally run on roads with posted speed limits

- of 25 mph that also meet the city's definition of a low-stress roadway as identified in Chapter Two of the SMP
- Class IV Physically separated lane for bikes and non-NEV on-street slow modes; 35 mph roadway shared by cars and NEVs (recommended 5' minimum in each direction)

In cases where speed limits are over 35 mph, current California law would require lowering the spped limit to accommodate NEVs. NEVs cannot travel on roads with a speed limit of over 35 mph.

By preparing an NEV Plan, cities have been granted exemptions from the California Vehicle Code rule that restricts NEVs to roads with speed limits of 35 mph and under. NEV Plans lay out the design and engineering for NEV networks - including striped lanes and crossings shared by NEVs on specific roads with speed limits higher than 35 mph.

These planning and engineering proposals require buy-in from law enforcement and Caltrans, and then are submitted by cities and Council of Governments to the state legislature so lawmakers can make the necessary additions to the California Vehicle Code granting exemptions. The final steps would be the local adoption of the NEV Plan

by the city Council, and, five years later, a report back to the legislature on the safety performance of the network. [This page is left intentionally blank]





## **COMMUNITY PERSPECTIVES**

#### **INTRODUCTION**

The City of Carlsbad designed and implemented a Communications Plan to guide outreach to the wide range of stakeholders and community members and inform the development of the SMP.

Importantly, the community outreach approach included multiple activities tailored to address the unique needs and interests of each stakeholder group, and to promote meaningful engagement in the planning process. The overall goals for community outreach included the following:

- Educate the community on the SMP need, purpose, benefits, process and engagement options
- Design and implement engaging activities to provide clear and easily accessible opportunities for community input about the SMP
- Build relationships with partners that can extend the reach of public engagement efforts
- Utilize community input to inform context-specific mobility solutions

This chapter provides a summary of the community outreach activities for the SMP. The draft Communications Plan is provided in Appendix C.

#### **IN THIS CHAPTER**

- Summary of the community engagement approach and key findings
- Conceptual priorities to help guide project identification and prioritzation efforts

#### **INITIAL RESEARCH**

The City and project team members conducted initial research activities at the early stage of the SMP process to inform development and implementation of the Communications Plan. Initial research activities included a business survey, message development, focus groups and field intercepts.

Business Survey: The City's Transportation Department conducted a survey of businesses and their employees, focusing on specific mobility behaviors and choices, including the following:

- Reasons for choosing a transportation option other than driving alone to work
- Benefits experienced from commuting to work using an option other than driving alone
- Barriers to using options other than driving alone

Message Development: City staff from multiple departments and project consultants collaborated in reviewing messaging from existing plans and public information to develop a unified messaging platform.

NV5, communications consultants to the City, led efforts to study options for refined messaging, program names and branding to support public awareness of sustainable mobility.

Focus Groups and Field Intercepts: Action Research, evaluation consultants to the City, led efforts to engage residents, employees and visitors through focus groups and field intercepts. The purpose of these activities was to understand transportation habits and preferences, as well as public understanding of sustainable mobility.

Collectively, these research activities provided City staff and project team

members with a strong mix of qualitative and quantitative data that highlight levels of public awareness, understanding and support for sustainable mobility in Carlsbad.

Importantly, this data provides the City with perspectives about how public communications and outreach can be most meaningful and engaging for the range of stakeholders and community members in developing the SMP, and for future implementation.





## STAKEHOLDERS AND TARGET AUDIENCES

Overall, the Communication Plan focused on reaching all stakeholders and community members in the City. For the purposes of organizing efforts and activities, categories of stakeholders and communities of interest included the following:

- General Public
- Planning Groups
- Professional and Community Associations
- Businesses and Corporations (small and large) and Business Groups/ Organizations
- Business Parks
- Education and School Districts (elementary to college, including teachers, students, parents, scouts and other groups)
- Environmental Groups/Organizations
- Transportation Groups/Organizations
- Medical and Public Health Groups and Professionals

- Recreation Groups/Organizations
- Housing Groups/Organizations
- Internal (managers, staff, consultants, etc.)
- Local Government (staff, city councils)
- Media (local, state, national and international)
- Regional Elected Officials (and staff)

- Regional Transportation Boards
- Civic Groups and Clubs
- Tourists

The following sections summarize key outreach and engagement activities undertaken by the project team.

Brian Gaze leading outreach plan



#### Stakeholder Working Group

Brainstorming an action plan

The Stakeholder Working Group (SWG) for the SMP served to provide insights to the City and project team regarding the methodology and prioritization of projects. SWG members also advised on and provided support to broader stakeholder engagement and communications efforts to support the planning process.

Approximately 30 community representatives were invited to participate as members of the SWG. Twenty-one organizations accepted and more than 25 representatives attended the SWG meetings.

At each of the four SWG meetings conducted at key points in the planning process, participants reviewed the latest project updates and provided input on technical developments.

ary of chasses SUSTEMMABLE MOBILHY PLAN STAKEHOLDER WORKING GROUP 0 7 NEW PAIL MERWA #3 X-INGS W/ +FY CREUC BOLLATON JANUARY 15,2019 -SPEED PROCESS UPDATE - SHE POTES DELPH PEGUTS -RONDABOUTS BILEWAY SINNOVATION! SENMS - CONSTAL FORUS DEDOST PESCHSES . TRANSIT MOTEUN REGINAL COOPPINATION - PEROVIC PLOSES THIS - ENGAGE WINSIGHBOR CITIES ESWOAG - INTER-DEDARTMENTEL CRULADE SHUTUS? . TOPPIME PROSPEM & COSTS WEER THIS OF C · myspeck DATHOTS THE WELLEN SET : JERICATE BYT STEPS PREVIOUS "FLEX SHUTTLE!" THE WALUF WAS EFFECTIVE OF BONNABOUS! -PLAN ADOPTION S MOTERNAMENTATION? - MUISCRY OPER IMPROMENTS COSTS & TIMBPRIMARS IMPLEMENTATION MERCITY P BETBIRISED compagazion



Carlsbad Mobility Plan

#### Informational Collateral Materials

Project team members developed a suite of content in the form of narrative descriptions, images and graphics to use in informational collateral materials. These included PowerPoint slides, handouts, invitations, fact sheets, informational poster boards, sign in sheets and other materials in formats suitable for either print or electronic distribution.

#### **Project Webpage**

The City developed a SMP webpage on its website with a high-level overview of the project purpose and goals. Project team members updated the content during the planning process after each SWG meeting to provide access to meeting materials, background information and other related reference materials.

#### Online Survey

An online survey was conducted to better understand needed mobility improvements for walking, biking, taking transit and getting to school.

#### **Community Meetings and Presentations**

Project team members conducted community meetings and presentations with key stakeholders during the planning process to explain the purpose of the project, and focus discussion on specific topics of interest and concern. Community meetings and presentations occurred as requested by the following groups:

- Agua Hedionda Lagoon Foundation
- Carlsbad Chamber of Commerce
- Carlsbad Unified School District

superintendent and principals

ViaSat Sustainability Team

#### Farmer's Market Booth

Project team members engaged community members regarding the SMP at the State

Street Farmers Market in Carlsbad Village on December 12 and 19, 2018 and January 9, 2019. The purpose of these engagements was to conduct direct public education and receive input using the project survey, via the web or print versions.

Carlsbad residents participating in an outreach activity at the local Farmer's Market



#### **Additional Activities**

Project team members conducted additional activities as follows:

- Social Media: SWG members and City departments assisted in promoting the SMP through their social media platforms
- Cyclist Outreach: Project team members distributed customized information materials as "handle-bar flyers" and at organized cycling rides to encourage public input via the survey
- Tours: As part of SWG meetings, project team members and select community partners provided tours of workspaces that promote sustainable mobility

# METROQUEST ONLINE QUESTIONNAIRE

The Metroquest-hosted online questionnaire

"Carlsbad does a great job with the bike paths, keep up the good work!"

included an introductory page with an overview of the SMP effort and five landing pages. The questionnaire was linked from the City webpage with a number of collateral materials. The first page was an introductory page and provided an overview of the SMP effort.

#### **Prioritization Exercise**

The second page of the questionnaire asked people to rank their priorities for the SMP. The SWG recommended eight possible priorities for the City to emphasize in future project development efforts. Each priority included a brief description and photo of the priority. Respondents were asked to rank their top five priorities, using a "1" to reflect their highest and "5" to reflect their lowest priority.

The eight priorities listed were:

- Gap Closure Improvements that create connectivity by removing gaps or barriers in places people walk or bike - for example, completing a sidewalk.
- Innovation Technological innovations can enhance convenience and safety, and innovative designs can make it safer to walk and bike

"Keep doing what you are doing - the long-range planning and saving, creating reserves for sound investments, is appreciated."

throughout Carlsbad.

- Location Scope of Benefit prioritizes projects that benefit the greatest number of residents and employees.
- Short-term Implementation Refers to "quick-build" projects that could occur within the City's existing right-of-way and would not require extensive design or additional studies.
- First/Last Mile Services Refers to the beginning or end of an individual trip, primarily on transit or via other means such as biking or walking, in order to access job sites.
- Regional Significance Any project that ties into, or is a piece of a larger regional project. An example is San Diego County's Coastal Rail Trail.
- Cost Effectiveness Looks at project cost compared to return on investment. For example, in terms of

"It would be nice to have a shuttle service from downtown to the outlet mall, Costco, etc."

new users, improved safety, or other benefits

 Social Equity - Helps ensure people of all ages, abilities and backgrounds would benefit from new projects and investments.

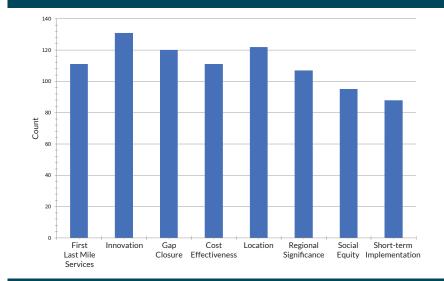
#### **Results of Priority Rankings**

Count - From a total of 131 respondents ranking their top five priorities, Innovation was ranked first (31 respondents), followed by Location, Gab Closure, Cost Effectiveness and First-Last Mile Services. See Figure 4-1.

Average Score - The highest-ranked priority from respondents was First-Last Mile services, followed by Innovation and Gap Closure. In the exhibit at lower right, an average score closer to "1" indicates a priority more likely to be ranked first by the respondent. See Figure 4-2.

While not scientific, these findings helped shape the recommendations of this report by guiding the project team toward a focus on innovative solutions designed to close travel network gaps, particularly gaps in the journey to and from key destinations such as schools, job centers, and other popular locations.

## FIGURE 4-1 ALL COMMENTS RECEIVED BY CATEGORY (COUNT)



# FIGURE 4-2 ALL COMMENTS RECEIVED BY CATEGORY (AVERAGE)

FirstLast Mile Services	2.68
Innovation	2.76
Gap Closure	2.77
Cost Effectiveness	2.86
Location	3.01
Regional Significance	3.14
Social equity	3.15
Shortterm Implementation	3.24

#### **Mapping Exercise**

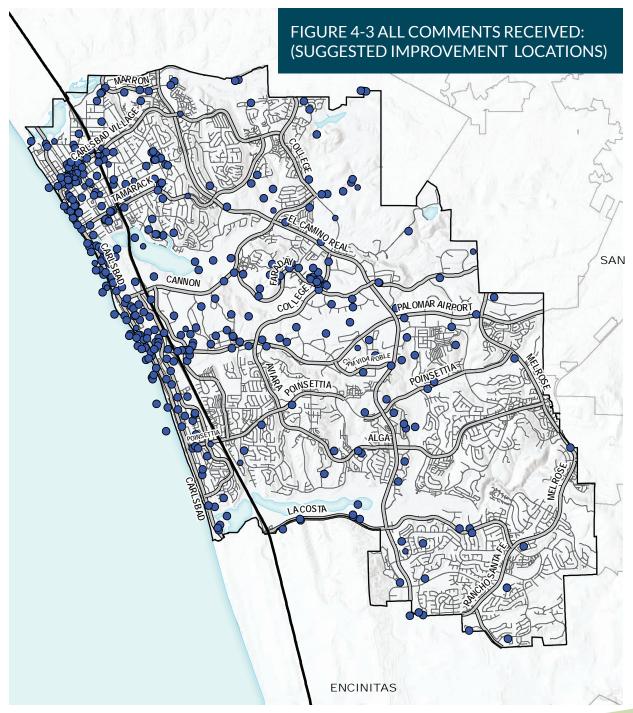
Screen three of the online survey asked respondents to identify locations where they thought the City of Carlsbad could make mobility improvements for walking, biking, taking transit or getting to school. There was an additional icon representing parking, which people could use to express concerns regarding parking at specific locations.

The results of these mapping exercises can be seen on the following pages. Figure 4-3 shows all comments received and the location of the issue for recommended improvement.

#### Visioning Exercise

The fourth screen asked respondents about their vision for the future of Carlsbad. Respondents were asked to complete the sentence, "In ten years, I want Carlsbad to be a place where ...." This question received 126 responses. Selected responses are included throughout the body of this chapter. A complete listing of all comments received can be found in Appendix D of this report.

The fifth and final page thanked respondents for participating, asked for basic demographic information (such as age, gender and zip code) and requested a contact email address if they wanted to stay in touch throughout the process.



#### Comments By Mode

Figure 4-4 shows each of the comments received online by comment type.

#### **COMMENTS RECEIVED**



125



89

COMMENTS



68

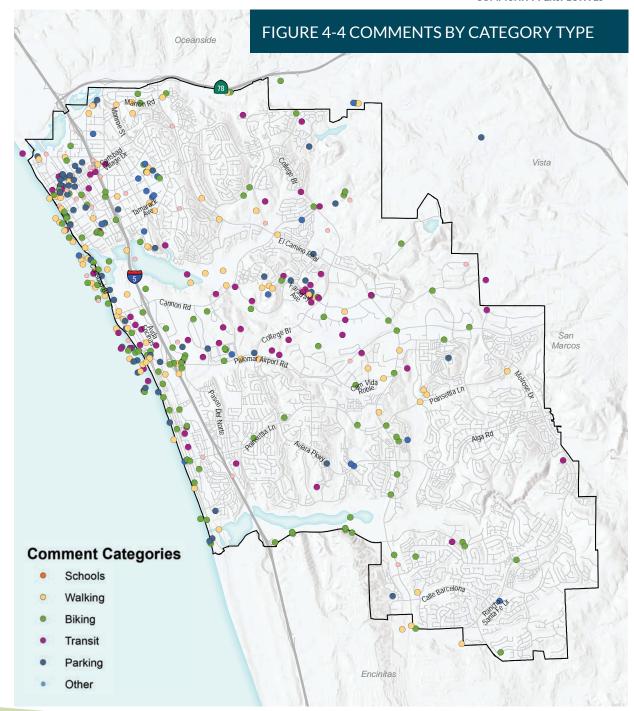
COMMENTS

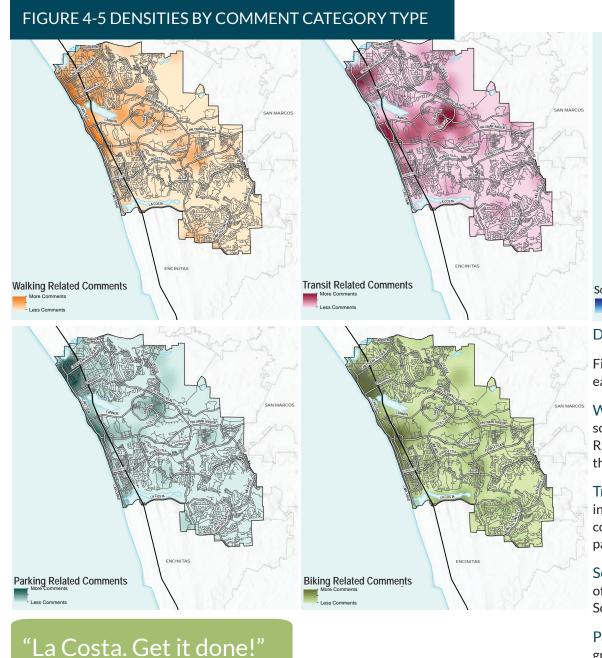


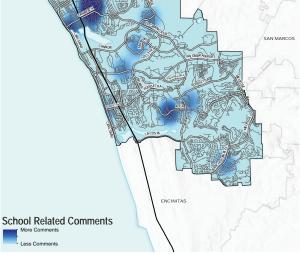
62

COMMENTS









#### **Densities by Comment Category**

Figure 4-5 shows the concentration of comments received for each of the five comment types.

Walking - A concentration of walking comments were received southeast of the airport and business district area, near Bressi Ranch. There is noticeable density across residential areas and the surrounding Village-Barrio area.

Transit - Comments for transit-related services were received in three main locations, including the Village-Barrio area, the coastal area near South Carlsbad State Beach, and the business park area.

Schools - School comments are distributed throughout the City of Carlsbad, with the cluster of schools around Carlsbad High School being the most common location cited.

Parking - Parking comments are similar to that of transit, with a greater concentration near the Village-Barrio area.

Biking - There are concentrations of cycling related comments near the coast and in the Village.



## 150 COMMENTS BY WOMEN

26% WALKING-RELATED (most common category for women)



### 183 COMMENTS BY MEN

40% BIKING-RELATED (most common category for men)

#### Comments By Gender

The top map shows the density of female comments, reflecting a concentration of comments in the business park district.

The bottom map shows the density of male comments, which are more dispersed across the City. Males show higher rates of comments in the residential areas compared to females.

Both male and female respondents had comments addressed towards the coastal and Village-Barrio area as a whole.

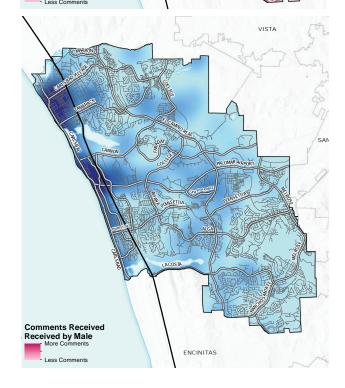
"In ten years, I want Carlsbad to be a place where motor vehicles were phased to second place; personal mobility was moved to forefront."

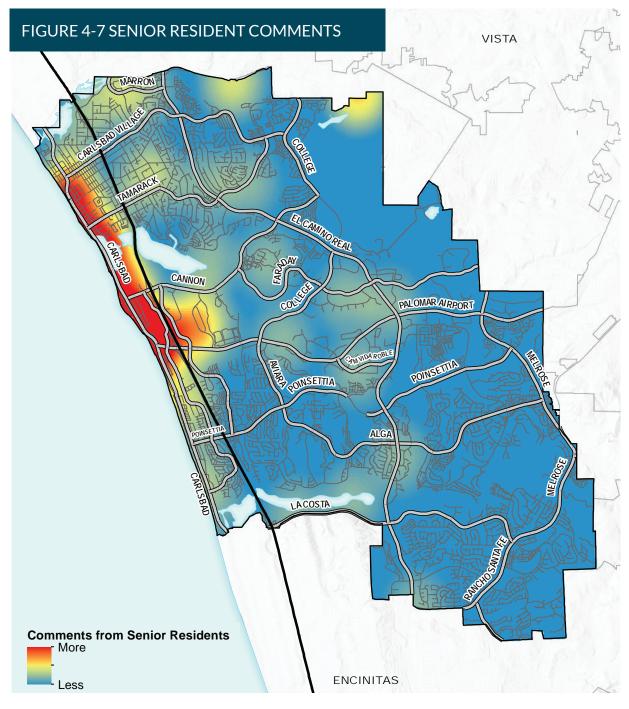
"In ten years, I want Carlsbad to be a place that prioritizes people over vehicles, where transit options create vibrant, walkable and bikefriendly places." "We love sidewalks to be complete and provide easy access to restaurants and grocery stores."

# CANCIL DAS REPORT

Comments Received Received by Female

FIGURE 4-6 COMMENTS BY GENDER





#### **Comments From Seniors**

Figure 4-7 displays the distribution of 70 comments received by seniors - those who stated they were 66 years or older. A majority of the comments were directed to the coast, specifically the area around North Ponto and South Carlsbad State beaches.

"[The] built environment has been made to prioritize cars. We should generally invest more in public transportation, bike lanes, and walkable areas. This is an issue of social equity and climate."

"It would be amazing to have more frequent buses or a trolley along major thoroughfares toward the beach so people can access the beach without driving." [This page is left intentionally blank]





# PLANNED MOBILITY NETWORKS

This chapter presents the SMP proposed citywide networks for walking, trails, cycling and transit. These networks respond to the needs identified through extensive community engagement, field reviews, existing conditions analysis and previous planning efforts. The intended outcome is a Carlsbad transportation system that accommodates people of all ages and physical ability, as well as people who choose to leave their car behind. The SMP networks aspire to invigorate modal shifts away from single occupant driving to walking, cycling and transit.

The planned networks for walking, trails, cycling and transit are described in the following sections, which are then followed by a presentation of the Carlsbad Sustainable Mobility Network, which consolidates those travel corridors providing multi-modal travel options across the City.

The SMP serves as the required update to the City's bicycle and pedestrian master plans and also provides consistency with recommendations from recent planning initiatives such as the Village and Barrio Master Plan, the Comprehensive Active Transportation Strategy, the Trails Master Plan, and the Regional Transportation Plan.

By increasing the safety, connectivity and competitiveness of walking, cycling and transit, the SMP proposals will allow the City of Carlsbad to make better use of existing resources, protect undeveloped spaces, and better manage future impacts and demands on public spaces.

Implementation of the planned networks is supported by state-of-the-practice design guidelines (in Appendix B) intended to facilitate proposed infrastructure improvements.

#### IN THIS CHAPTER

- Summary of the ways people will get around in the future
- Conceptual improvements to implement future mobility hubs
- Summary of recent initiatives to improve existing transit service and provide a new employee shuttle pilot project

#### PLANNED PEDESTRIAN NETWORK

The Pedestrian Master Plan of 2008 governs the development and implementation priorities of places for people walking in Carlsbad. Following the identification of a number of priority locations and corridors, the City developed an ADA Transition Plan in 2013 to assist in prioritizing accessibility gaps and upgrades designed to make the city more accessible for people with disabilities.

Since 2008, a large number of these priorities have been implemented through the CIP process – chiefly the installation of new sidewalks on priority corridors, high-visibility crosswalks, midblock crossings, signal timing adjustments and other intersection amenities such as audible countdown timers, pedestrian scrambles, and wayfinding elements in Carlsbad Village.

The City of Carlsbad is committed to addressing substandard sidewalks, crosswalks and other small-scale improvements wherever feasible through the CIP process, and will continue its commitment to retrofitting existing intersections with upgraded, high visibility crosswalks, and improvements for people with disabilities consistent with the prioritization efforts of the adopted ADA

Transition Plan. Larger projects such as those designed to overcome barriers with at-grade rail or freeway crossings, closing gaps in the Coastal Rail Trail Multi-Use Path, projects requiring additional right-of-way, or other complex design considerations will likely require additional funding for feasibility studies and design services.

Figure 5-1 shows the planned pedestrian network, including priority intersections for enhanced pedestrian treatments, priority corridors per the 2008 PMP, school streets, and missing or substandard sidewalks. The priority intersections for enhanced pedestrian treatments could include consideration of roundabouts. Figure 5-1 shows potential traffic circles (roundabouts) and bulb outs in the Village area. Several locations throughout the City of Carlsbad have been identified as "Alternative Design Streets." This designation precludes the installation of sidewalks. Cities throughout the region have begun developing ways to better delineate places for people walking within the roadway though pedestrian-only lanes on low-speed, low-volume residential streets. Typically this involves restriping to provide a 5' to 6' "door zone" buffer space adjacent to narrow travel lanes (often lacking centerline striping) and the installation of a bi-directional "pedestrian only" stencil. An

example of this treatment from the City of Encinitas is shown at right.

With the recent creation of "School Streets" as part of the Mobility Element and the City of Carlsbad's commitment to providing safe routes to schools, several street segments adjacent to Carlsbad High School are potentially in conflict with one another. They simultaneously encourage the creation of dedicated places for people walking, yet prevent these places from being traditional sidewalks. Finding a solution to this conflict is an important outcome of the SMP, and "pedestrian only" lanes represent an excellent opportunity to do so.



Pedestrian-only bidirectional walking zone in Encinitas, CA



Table 5-1 Summary of Pedestrian Network Mileage

Classification	Existing	Adopted	Percent Change				
Multi-Use	3.2	11.0	244%				
Priority Corridors for Enhanced Treatment	0.0	54.4	-				
Existing Sidewalks	833.9	833.9	0%				
Missing/ Substandard Sidewalks	30.0	30.0	0%				
School Streets	13.4	13.4	0%				
Alternative Streets	24.0	24.0	0%				
Total	904.4	966.6	7%				

Table 5-1 presents the planned pedestrian network mileage. As shown, an additional 7% will be added to the total mileage of the pedestrian network under future conditions. There will be 11 miles of planned Multi-Use Paths and 54.4 miles of Priority Enhanced Corridor Treatments.

The City has made progress in implementing the improvements identified in the Pedestrian Master Plan and ADA Transition Plan, and is encouraged to continue the focus on priority projects identified in each document, particularly those in and around school zones including the Carlsbad High School, Magnolia Elementary and Valley Middle Schools, Aviara Oaks and Calavera Hills areas, among others

Safe Routes to School Conceptual Improvement Plans of this document (Appendix E) includes a number of additional location-specific findings for small infrastructure capital improvement projects around school zones citywide, including high-visibility crosswalk upgrades, signage designed to limit the number of illegal U-turns during student pick-up and drop off, and speed feedback signs. The City is encouraged to implement these improvements on a rolling basis as funding allows.

Larger projects recommended for people walking include the extension of the Coastal Rail Trail and potential improvements for people walking along Carlsbad Boulevard south of Tamarack Avenue. These improvements will likely require additional right-of-way, planning and engineering services to arrive at a preferred alternative.

As with cycling projects, the SMP Design Guidelines provide the City with engineering flexibility to implement additional spot treatments citywide, including revisions to



Nature Trail in Carlsbad, CA

midblock crossing designs, traffic calming as appropriate, and improved transit access.

#### PLANNED TRAIL NETWORK

The Trails Master Plan (TMP) builds upon previous efforts by city staff, volunteers, and private development partners over the past twenty years to develop a citywide trails network within the City of Carlsbad.

The TMP takes into consideration larger

public and private projects, and has enhanced corridors to create a well-connected network. One key desired outcome of the TMP is to provide access to trail facilities within ten-minutes of every resident's front door.

Figure 5-2 shows the planned trail network, including recreational trails, roadside trails, sidewalk connectors and paved, multi-use paths.

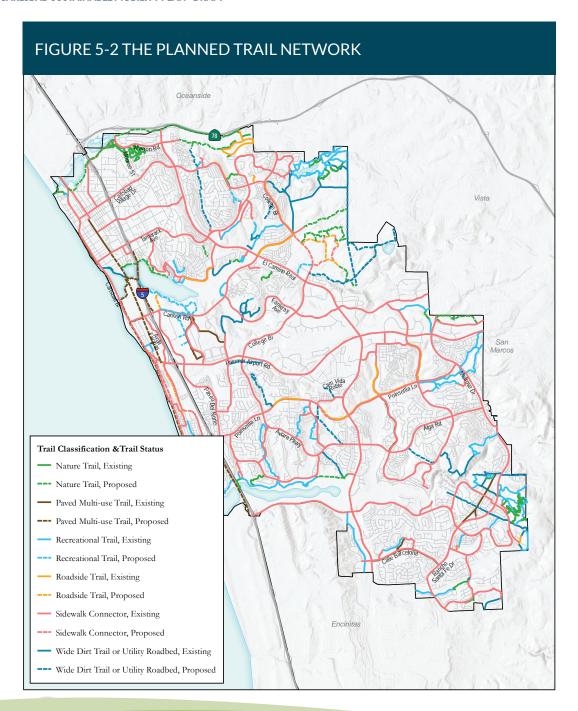
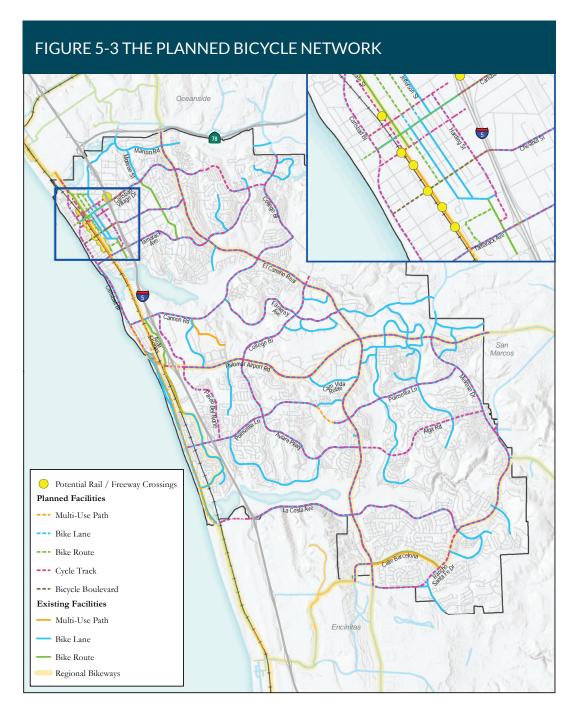


Table 5-2 Summary of Trail Network Mileage

Trail Classification	Existing	Adopted	Percent Change
Nature	11.4	23.6	107%
Recreational	26.6	30.8	16%
Wide Dirt	13.2	22.2	68%
Roadside	7.8	11.8	51%
Sidewalk Connector	105.5	113.0	7%
Paved Multi-Use Path	7.8	17.4	123%
Total	172.3	218.7	27%

Table 5-2 shows the existing and planned trail network mileage. As shown, 30.8 miles of Recreational Trails are planned. There will be a 51% increase in Roadside Trails, a 7% increase in Sidewalk Connectors, as well as a 123% increase in paved Multi-Use Paths. This will result in a total of 218.7 planned trail miles, which is a citywide increase of 27% from the existing 172.3 miles.



## PLANNED BICYCLE NETWORK

The SMP proposes a comprehensive backbone network of Class IV Cycle Tracks across the City of Carlsbad that will ensure safe and comfortable cycling for residents of all ages and physical ability. Cycle tracks are envisioned within the roadway right-of-way and are physically separated from vehicular travel via a raised buffer.

Cycle tracks will be designed to increase residents' sense of safety and comfort while cycling, and allow for increased mobility and access to key destinations throughout the City by bike. The network of cycle tracks will help the City realize green house gas (GHG) and vehicle miles traveled (VMT) reduction targets through transitioning existing vehicle trips to bicycling trips, particularly the 40-45% of all trips citywide that are under 3 miles in length.

Figure 5-3 shows the planned bicycle network as well as potential pedestrian, bicycle, rail and freeway crossings. Table 5-3 summarizes the planned bicycle network mileage, which reflects a citywide increase of 120% in bicycle network miles.

Table 5-3 Summary of Bikeway Mileage

Classification	Existing	Adopted	Percent Change	
Multi-Use	3.2	10.6	230 %	
Bike Lane	100.4	36.3	-64 %	
Bike Route	5.1	6.8	34 %	
Cycle Track	-	66.8	-	
Bike Boulevard	-	0.4	-	
Total	108.7	239.1	120%	

The greatest opportunity to increase safety, access and comfort for people biking is with the conversion of existing bike lanes and buffered bicycle lanes to Class IV Cycle Tracks where feasible.

Pending detailed feasibility studies, initial analysis supports reclassifications of existing bike lanes to cycle tracks along the following key corridors:

- Cannon Road
- Carlsbad Boulevard south of Tamarack
- College Boulevard
- El Camino Real
- Faraday Avenue
- La Costa Avenue

- Melrose Drive
- Poinsettia Lane
- Aviara Parkway

The mobility benefits of this reclassification process are many. Cycle tracks have been shown to greatly increase cycling levels, particularly for people bicycling short distances and for less confident riders.

Several surveys indicate people feel safer and more protected with the installation of a raised median or curb within the buffer area. In fact, separated green lanes reduce bicyclist injury risk up to 90 percent (Teschke, 2012). Drivers have been observed to slow the speed at which they drive along a corridor following the installation of cycle tracks, which in turn allows a city to lower the posted speed limit.

Further, the installation of cycle tracks allows for clear delineation between turning vehicles and people on bikes at intersections by prohibiting turning vehicles from queuing in the bike lane prior to making a right turn.

This improvement would likely be of significant benefit along high-speed, high-volume arterials citywide.

In addition, recent City efforts to prepare for potential future shared mobility modes such as electric bikeshare may benefit from dedicated cycle tracks, as users frequently cite the existence of physically separated facilities as a key factor in their decision to use shared mobility devices and services.

Feasibility and eventual implementation of these treatments would be determined by the City traffic engineering staff and are subject to funding availability, resurfacing schedules, and other considerations.

Due to constraints within a corridor, separation may not be achievable for the entire length of the route, and it may be necessary to maintain conventional or buffered bike lanes in some locations.

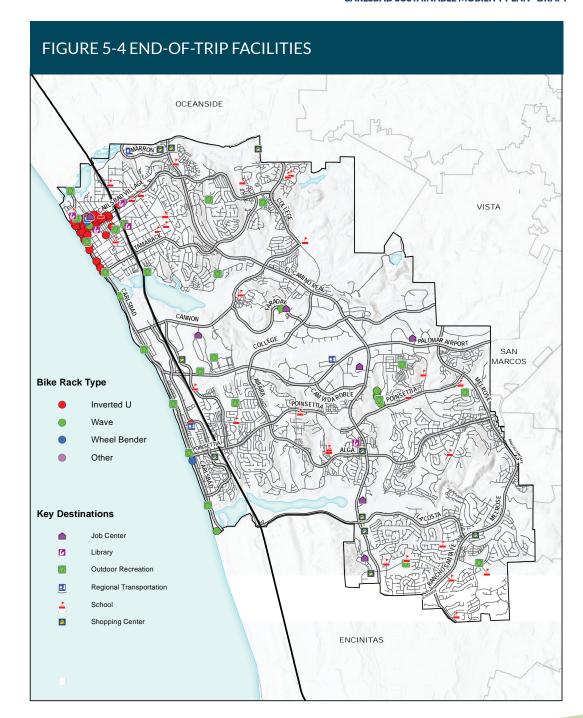


One-Way Class IV Cycle Track. (Source: NACTO)

In addition, the City's SMP Design Guidelines provide for significant improvements for people on bicycles at intersections through the use of green paint, dedicated bike boxes, and other treatments designed to better delineate places for people on bikes at high-volume areas of potential conflicts with vehicles.

The City has invested significant resources in recent years toward accommodating people on bikes throughout the city with end-of-trip amenities such as bicycle parking in and around Carlsbad Village and beach access points, as well as ordinances designed to make it easier for employers to provide changing facilities and showers for employees who choose to bike to work. Figure 5-4 displays the existing end-of-trip facilities across the city.

Future considerations for people biking involve additional bicycle parking amenities citywide, particularly the replacement of existing racks at the end of their useful life, and additional features at potential Mobility Hub locations described later in this chapter.



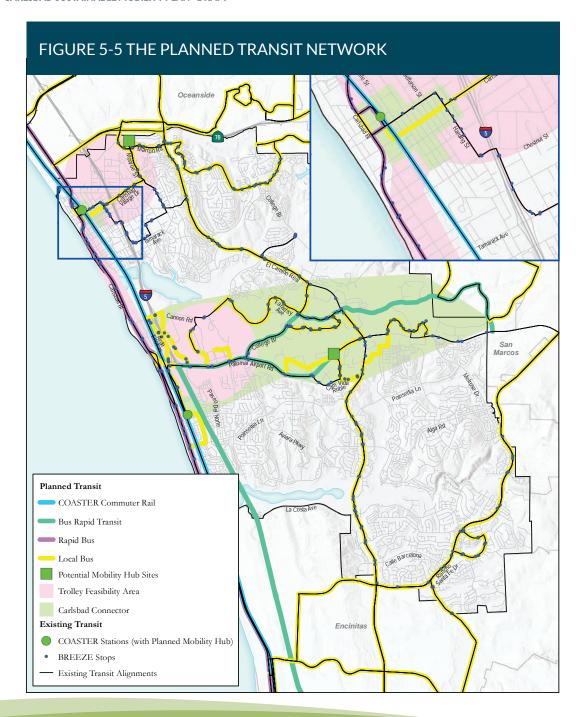


Table 5-4 Summary of Transit Network
Mileage

Classification	Existing	Adopted	Percent Change	
Coaster Commuter Rail	6.6	6.6	0%	
Bus Rapid	-	12.6	-	
Rapid Bus	-	7.2	-	
Local Bus	50.2	35.5	-29%	
Total	56.8	61.9	9%	

#### PLANNED TRANSIT NETWORK

While the City of Carlsbad has limited ability to develop and implement transit service operations, several aspects of a persons ability and willingness to take transit are nevertheless under the city's jurisdiction, including first-last mile connections to existing bus route service, as well the development, promotion, and accommodation of alternative transportation services such as employee or visitor shuttles, mobility hub services, and programs designed to incentivize transit through subsidy or other means.

Figure 5-5 shows the existing and planned transit networks for the City of Carlsbad per SANDAG's Regional Transportation Plan (RTP) Year 2035 network. As shown, the City of Carlsbad has north-south transit service along Carlsbad Boulevard, the commuter rail corridor, and El Camino Real. There are future plans for Bus Rapid Transit along the I-5 corridor that would connect to Palomar Airport Road and College Boulevard. There are also future plans for Rapid Bus along Carlsbad Boulevard that would run the entire length of the city. Table 5-4 presents the planned transit network mileage. As shown, an additional 10% of express bus service is planned, bringing the total transit network miles from 56.8 existing miles to 61.9 planned miles.

The City is committed to upgrading a number of transit

stops in high-ridership locations and providing additional transit service options.

There are four high-ridership transit center locations identified in the City of Carlsbad as potential Mobility Hubs, as follows:

- Carlsbad Village COASTER Station
- Poinsettia COASTER Station
- The Shoppes at Carlsbad
- McClellan-Palomar Airport

Conceptual alternatives for the four sites are shown in Figures 5-6, 5-7, 5-8, and 5-9.

The mobility hub concepts include a number of multimodal features including; smart parking, Transportation Network Companies (TNC) pick-up and drop-off locations, bikeshare, carshare, on-demand rideshare, microtransit facilities, wayfinding, as well as enhanced transit service.

The McClellan-Palomar Airport Mobility
Hub will have a Smart Park Technology
station indicating how many parking spaces
are utilized at a given time. A designated
TNC pick-up/drop-off area will be provided
at the northern end of the lot. There will
be bikeshare, scooter share, and bikerelated repair stations that allow space
for micromobility users. Enhanced bicycle
and pedestrian treatments will be made at
the intersection of McClellan/Yarrow Dr
and Palomar Airport Road. There will be
reserved parking spaces for microtransit,
neighborhood electric vehicles, and shuttles.

#### FIGURE 5-6 MCCLELLAN-PALOMAR AIRPORT MOBILITY HUB CONCEPT



Wayfinding will be located throughout the mobility hub site to help users navigate. There will be a designated area for priority parking for electric vehicles, carshare, carpool, vanpools, as well as charging stations. Lastly, there will be an enhanced bus stop as well as priority transit signaling to allow for easy flow of traffic.

The Shoppes at Carlsbad Mobility Hub will also include all features of the McClellan-Palomar Airport Mobility Hub. The existing transit stop will be upgraded to allow for better flow of traffic. Exact locations for the other services are conceptual and will be adjusted for feasibility, engineering, and costing when implemented.



Mobility Hub Diagram (Source: SANDAG)

# FIGURE 5-7 THE SHOPPES AT CARLSBAD MOBILITY HUB CONCEPT

Reserved Parking for Microtransit, NEVs, and Shuttles Priority Parking for EVs, Car Share, Carpool, Vanpools, and Charging Stations

TNC PUDO

Bikeshare, Scooter Share and Bike Related Repair



Wayfinding Signage

Upgraded Transit Stop

Smart Park Technology

Wayfinding Signage

Coordinate with City to Create Low Stress Street Environment for Bikes and Scooters

The Poinsettia Coaster Mobility Hub will include all features of a mobility hub as mentioned in the McClellan-Palomar Airport Mobility Hub, and will expand on the existing train station. Conceptual improvements show transforming the existing pick-up/ drop-off portion of the parking into a space for a variety of users such as microtransit, NEVs, shuttles, vanpools, carshare, TNCs, and electric vehicles.



Existing Poinsettia Station (Source: SANDAG)

# FIGURE 5-8 POINSETTIA COASTER MOBILITY HUB CONCEPT



Coaster Station Platform

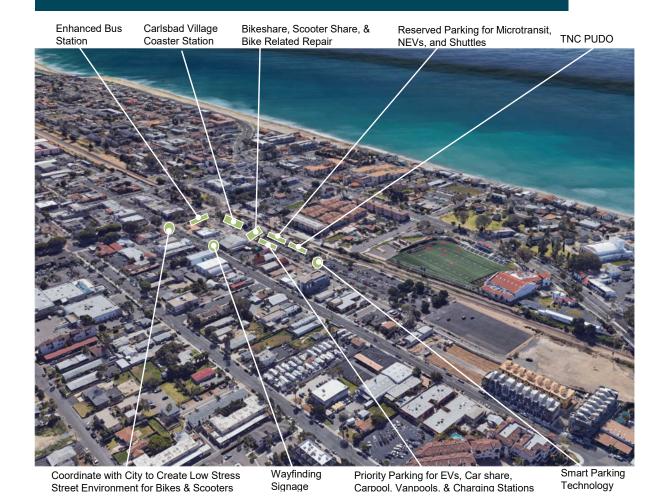
Wayfinding to Reserved Priority Parking for Coast Highway Microtransit, NEVs, and Shuttles

Priority Parking for EVs, Carshare, Carpool, Vanpools, and Charging Stations

**Smart Parking** Technology

The Carlsbad Village Mobility Hub will include all mobility hub features as mentioned in the previous mobility hubs concepts, but it will transform the existing Coaster station site into a space for a variety of users, similar to that of the Poinsettia Coaster Mobility Hub. The existing bus station will be enhanced to serve better traffic flow. Due to the limited and concentrated space for this mobility hub site, the exact location for each service should be considered when implementing by using engineering, feasibility, and costing judgements.

# FIGURE 5-9 CARLSBAD VILLAGE MOBILITY HUB CONCEPT



# PILOT TROLLEY SHUTTLE

The Trolley Program Feasibility Study proposed implementing a local trolley within Carlsbad to serve high employment areas between the city's two coaster stations and mobility hubs at Carlsbad Village and at Poinsettia. Figure 5-10 shows the key travel flows that will be served by the pilot trolley shuttle.

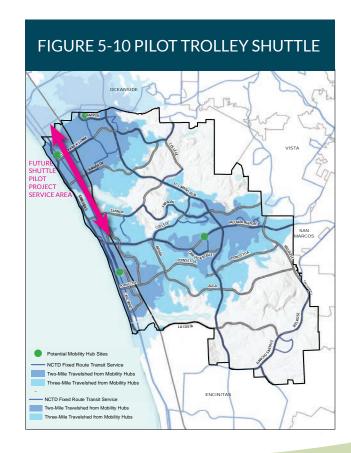
A pilot trolley shuttle is scheduled to start during the Summer 2019 to connect Coaster riders with the employment rich areas of the city. The basic shuttle service characteristics include the following:

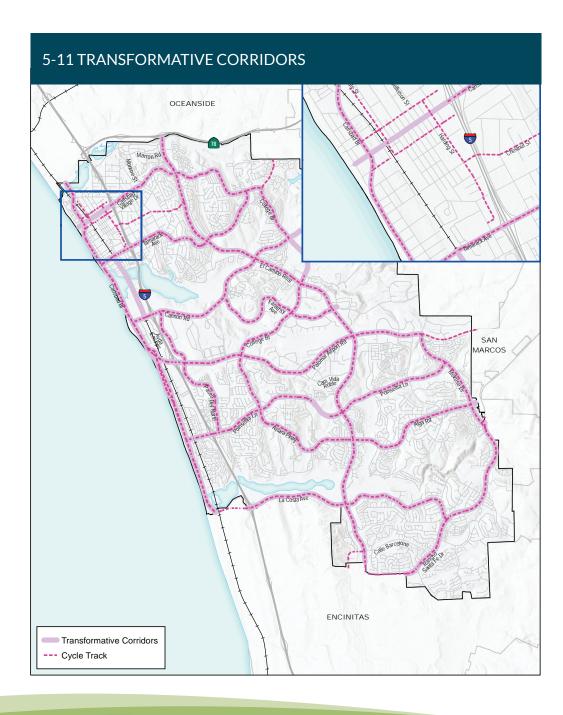
- Morning service from 7-9AM, capturing the 7:09AM and 8:36AM northbound COASTER trains
- Afternoon service from 12-6PM.
   The afternoon service would allow lunchtime trips for those that took the train in the morning, delivering commuters to the southbound COASTER trains at 3:43PM, 5:21PM and 5:51PM
- Four 12-person shuttles, one of which is fully ADA compliant
- Shuttles are equipped with Wi-Fi- and each shuttle will hold up to two bikes

- The system creates virtual stops that drop-off riders within a five minute walk from their ultimate destination
- The software optimizes drop-offs such that if 12 people all request to go to the same location, they will be grouped together and a single vehicle will go straight to that destination
- Customers can pay through the Coaster app
- Customers without access to smart phones may call in to reserve and pay for rides
- Customers with a COASTER monthly or day-pass will ride for free
- Individual rides are \$2.50 per ride, in alignment with North County Transit District fares
- Businesses can offer promotions to employees or customers and RideCo will bill businesses directly
- Data will be shared with all three agencies to help determine if service or stops need to be changed and for planning the viability of long-term service

The participating agencies have targeted

an average of 100 new daily boardings and/ or disembarkings, or an average of 50 new daily roundtrip riders on the COASTER train serving Pointsettia Station as a marker of success for the pilot project.





# TRANSFORMATIVE CORRIDORS

The layering of planned walking, cycling and transit networks reveals a strong backbone of "sustainable" corridors across the City. When built out, this planned network of sustainable travel corridors has the potential to transform the lives of Carlsbad workers and residents by providing well-connected and comfortable travel routes that enable access to all of the rich opportunities across the City without driving or riding in a personal vehicle.

Figure 5-11 presents the culmination of the SMP planning process in a Transformative Corridors map. Almost all of these Transformation Corridors will have cycle tracks, enhanced intersection treatments, and transit service thus providing Carlsbad residents and visitors with an array of travel options that do not require driving.





# PROPOSED MOBILITY PROGRAMS

This chapter presents key programmatic recommendations to support active travel infrastructure proposals presented in the previous chapter. The enhanced infrastructure, combined with programs for supporting behavior change will afford the City the best opportunities for shifting mode choice away from single occupant driving to walking, cycling and riding transit. This shift in turn will help to reduce greenhouse gas emissions, improve community health, and create a more vibrant City of Carlsbad.

Three programs in particular are presented in this chapter – Cycling Education, the Carlsbad Safe Routes to School and the Carlsbad Transportation Demand Management Program. Each is described in the following sections of this chapter.

#### **IN THIS CHAPTER**

 Summary of Mobility Programs, including Cycling Education Programs, Safe Routes to School and Transportation Demand Management Programs

# CYCLING EDUCATION

Facilitating educational programs to teach children and adults safe walking and bicycling behaviors can improve active travel practices in the City of Carlsbad. These would bring many benefits to the users, as streets would be shared respectfully and appropriately.

The following programs are proposed:

#### **Smart Cycling:**

This course is designed to get adults and children (must be accompanied by an adult) comfortable on the road and ready to commute or make short trips over two days, including a 3-hour classroom portion and a 6-hour road portion. Attendants should learn proper bike & helmet fit, safety tips for riding in traffic, techniques for navigating hazardous roads, emergency maneuvers, using public transit with a bike, their legal rights and responsibilities, as well as instructions on fixing a flat and bicycle adjustments.

#### Basic Bike Skills Class:

This course includes 1.5-hour classroom learning, and 2.5-hours on bike drills/on-road riding. It will cover general bike safety, legal rights and responsibilities, and emergency maneuver skills, with the purpose of getting riders comfortable on the road. Adults and

children under 18 are welcome, but they must be accompanied by an adult.

#### Bike Rodeos:

These are bicycle skills events targeting children and teens. They are taught on a school playground or parking lot, which provides them with the opportunity to practice and develop skills that will help them become better bicyclist and avoid typical crashes. Its objective is to teach young riders the importance of seeing, being seen and remain under control at all times when riding a bicycle. Bicycle skills stations give students the opportunity to practice a variety of specific bike handling skills and procedures for operating a bike legally and more safely on the street. As well, simulation to traffic situations help them improve their skills.

#### **School Assemblies:**

Elementary Safety Assemblies are a great way to get information about walking and biking safely to students from Kindergarten through 6th grade. This program consists of an interactive 40-minute presentation that covers the basics of walking and biking to school in a fun and exciting format for children. Helmet fit, bike rules, street crossing tips, driver communication, and sidewalk riding, are some of the topics taught. This

event can handle up to 250 students per assembly.

#### **School Community Rides:**

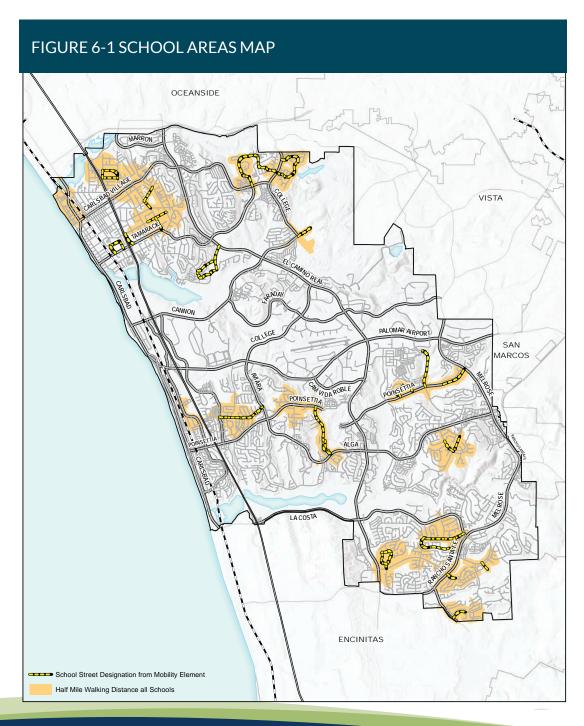
Community Rides offer kids and parents an opportunity to ride with an instructor safely around their own neighborhood. This ride is a way to utilize an existing road to practice new bike handling skills and best practices in a group setting. Separated bicycle facilities and roads with low traffic volume are used whenever possible. Bikes are for transportation as much as fun, and this ride helps to reinforce that.

## Brown Bag Presentation:

SD County Bike Coalition schedules a bike safety and bike commuting 45-minute presentation intended for employees during the lunch hour. This provides safety tips, information on the law, and a question and answer portion for curious new commuters.

# Group Ride:

These are 4-5 miles rides organized for groups of bicyclists. They are mostly on flat, separated facilities, and lightly traveled roads. They are done at a pace that encourages talking and interaction. Groups get to talk and stop a lot, while having fun and getting information about riding in various situations.



# SAFE ROUTES TO SCHOOL

Providing safe and connected routes to school can produce many benefits for City of Carlsbad residents and families. Reduced congestion around school sites, fewer GHG emissions, and a healthier student population are only a few of the benefits. Comprehensive SRTS programs include the 6 E's: Education, Encouragement, Enforcement, Engineering, Evaluation, and Equity, as outlined in the Emerging Mobility Chapter. Figure 6-1 shows SRTS walksheds around the 20 schools in Carlsbad, along with the School Streets roadway segments.

As the City begins to implement the SMP, student trips to and from school should be evaluated similarly to those trips taken by older adults.

The following priority strategies for implementation have been identified by the City of Carlsbad and their partners at the Carlsbad Unified School District:

# SchoolPool Carpools

Carpools can reduce traffic congestion and pollution in front of the school and still involve families who live too far to walk or bike. Carpools can be organized through school communications or online tools. In an effort to reduce congestion and emissions related with school trips, the City of Carlsbad implemented a pilot carpool program in fall 2019.

The effort will evaluate the effectiveness of messaging and program elements, and includes student tallies, parent surveys, and nationwide best practices research. If successful, participating school districts, school sites, and City of Carlsbad staff are encouraged to continue collaborative efforts and expand the program based on staff availability and capacity.

## **Parent Surveys**

The Safe Routes to School Parent Survey asks information about travel mode and distance, attitudes towards the program, and what factors affect whether parents allow their children to walk or bike to school. Surveys are frequently administered at the beginning and end of the SRTS program or school years in order to track behavior changes and overall success of the program.

The same survey can be utilized year-overyear to track progress against the baseline. A take-home survey can also be downloaded for free from the National Center for Safe Routes to School, but requires data entry to be completed by someone from the school or a volunteer.

It is recommended that the City coordinate with school district representatives to implement annual parent surveys to gauge current barriers to walking, biking, and carpooling to school to develop appropriate responses.

#### Walk Audits

This activity gathers parents and other interested community members together to review the school drop-off or pick-up period, evaluating traffic circulation, student loading, and travel behaviors along with transportation facilities within a quarter-mile radius of the school. The audit identifies potential solutions to parents concerns about active transportation and provides information for experts to create existing conditions maps, which depict both unsafe behaviors and surroundings. These observations can be translated into infrastructure improvement plans that prioritize recommendations.

Complete Walk Audit results for the 20 schools in Carlsbad are included in Appendix F of this Plan.

While baseline walking assessments have been conducted as part of this SMP process,

it is recommended that the City coordinate with school district representatives to hold regular walk audits, or provide a similar way for parents and school representatives to provide feedback on challenges facing parents and students in accessing their respective school areas.

#### Conceptual Improvement Maps

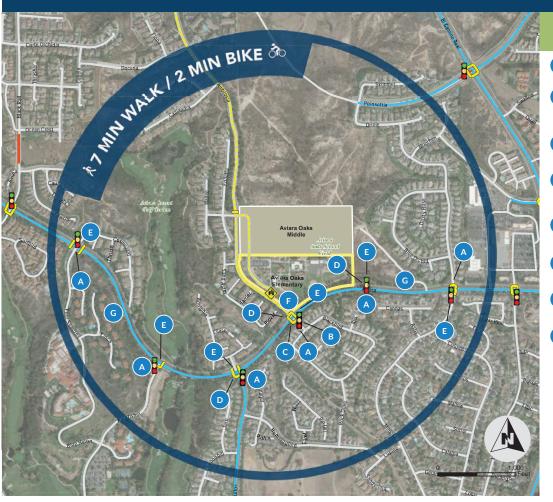
Information collected from the walk audits and other analyses can be used to identify the most urgent infrastructure improvements, such as sidewalk repairs and signal installations, and can be documented on a map. These maps support pursuit of future grant funding and provide useful information to public works staff about where improvements are needed.

SRTS Conceptual Improvement Maps for the 20 schools in Carlsbad are included in Appendix E of this Plan.

Figure 6-2 shows a sample Conceptual Improvement Plan for Aviara Oaks Elementary School.

# FIGURE 6-2 EXAMPLE CONCEPTUAL IMPROVEMENT MAP

# **Aviara Oaks Elementary School - DRAFT CONCEPTUAL IMPROVEMENT PLANS**



#### **Potential Improvements**

- Convert existing signal to audible countdown signal to increase awareness of signal
- Evaluate "No Right on Red" signage or Leading Pedestrian Interval to decrease conflicts between students and turning
- Evaluate signal timing adjustments to increase amount of time for students to cross street
- Convert existing school zone crosswalks to high-visibility continental crosswalks with advanced stop bar to reduce conflicts between students and vehicles
- Evaluate intersection striping where existing bike lanes enter intersection to improve delineation between vehicles and people on bikes
- Upgrade all legs of intersections to ADA compliance standards for users with
- Install speed feedback signs on all arterial streets to encourage predictable driving
- Evaluate roadway narrowing or additional measures to accommodate wider (6-8') places for people walking

Evaluate Feasibility of Alterative Pedestrian Facility in Areas with

Traffic Signal

Marked Crosswalk

School Access Point

Bike Lane

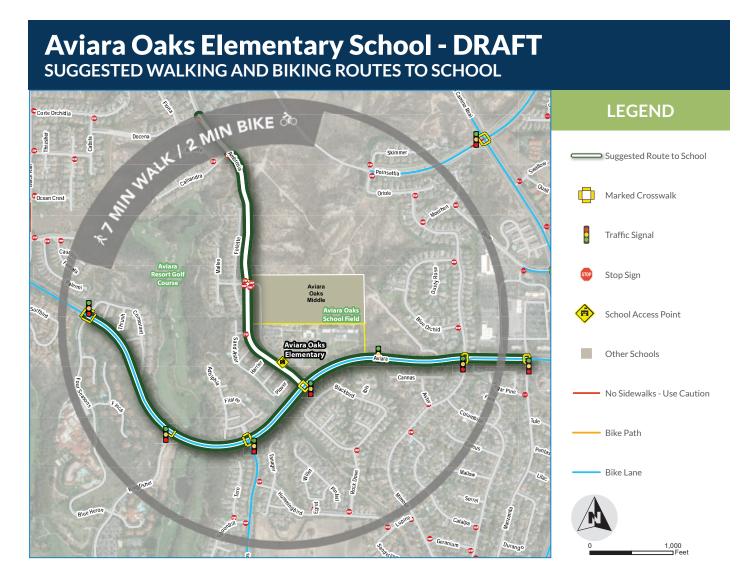
School Street

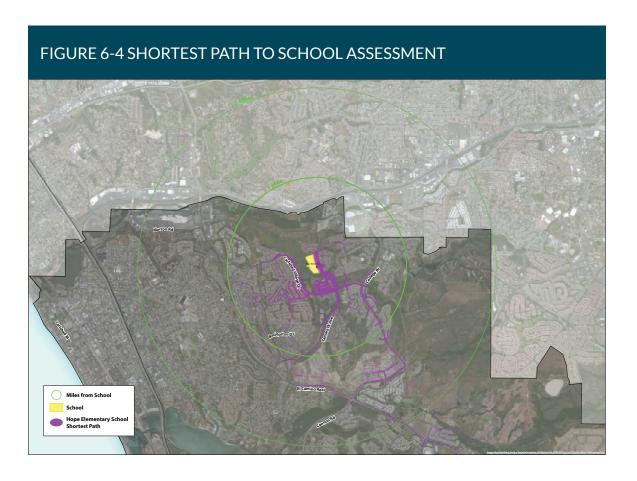
# FIGURE 6-3 SAMPLE SUGGESTED ROUTES TO SCHOOL MAP

# Suggested Routes to School Maps

Suggested routes to school maps are a great encouragement tool for families considering allowing their child to walk or bike to school. Maps can include walking school bus, bike train pick up and instructions for coordinating these programs. These maps should be continuously updated if road conditions change.

Suggested Routes to School maps for the 20 schools in Carlsbad are included in Appendix G of this Plan.





## Additional Technical Analyses

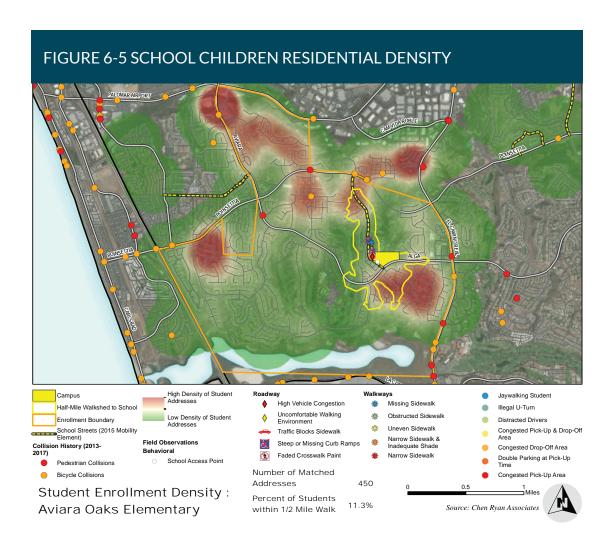
Student Shortest Path Assessment – This analysis determines the roadway links within a study area with the highest probability of walking route usage based on the location of the school entrance (destination) and the distribution of households (origins) within an attendance boundary.

The shortest path routes are modeled from every origin to the destination in GIS using network analysis. The overlapping paths are aggregated and assigned to network links in order to determine each link's relative importance in the network. The number of overlapping paths can be used as a weighting mechanism to assign priority to certain locations for infrastructure improvement projects.

This type of analysis should be used in conjunction with field review to account for factors in the roadway environment not related to shortest paths that may affect student route choices. Figure 6-4 shows an example of a shortest path assessment using line thickness to indicate more important roadway connections for student travel to a nearby school.

Student Address Pairing - Anonymous student address data from school districts was utilized to generate heat maps of current residential locations. This approach helps City and school district staff tailor SRTS infrastructure and non-infrastructure recommendations specific to each school's population. Schools with a large percentage of students living a mile or less from school will have a different set of needs than those living further away. Additional insights can be developed by comparing the location of students to the roadway network required to reach their respective campuses, and roadway classifications can be adjusted accordingly. Figure 6-5 shows the density of school children's residential location along with walk audit results.

School Children Residential Density maps for the 20 Carlsbad schools are provided in Appendix H of this Plan.



# TRANSPORTATION DEMAND MANAGEMENT

This section presents information to support Transportation Demand Management (TDM) programmatic efforts in the City of Carlsbad. These types of programs can assist employees to shift travel behavior away from driving alone to walking, biking and using transit. These programmatic recommendations support the network recommendations presented in Chapter 5.

The Transit & TDM Blueprint (the Blueprint) was developed to research and analyze commuter behavior, barriers to transit usage, inventory existing TDM programs, and assist in the adoption of a Citywide TDM Ordinance, which was adopted in 2019. The city adopted the City of Carlsbad Citywide Transportation Demand Management Plan in February 2019 which provides a framework for operationalizing TDM to meet the city's Climate Action Plan's target of reducing single-occupant vehicle trips by 30% by the year 2035. The Citywide TDM Plan focuses on infrastructure, regulation and policies, guiding resources, and a TDM program to support existing businesses. The Citywide TDM Plan also includes a monitoring and reporting program that will be carried out by

the Community & Economic Development Department.

Key commute characteristics of Carlsbad workers and residents are described in the following sections, followed by a summary of the newly adopted TDM Ordinance.

### City of Carlsbad-led Employer Surveys

An Employer Survey and an Employee TDM Survey were distributed to employers, employees, and residents of Carlsbad. These two surveys gathered information about existing commute behaviors and opinions about TDM strategies and alternative transportation options.

There were questions spanning all modes of alternative transportation, such as active transportation (biking and walking), public transportation, ridesharing, and more.

The following is a list of key findings reflecting a snapshot of the typical Carlsbad Commuter:

- Lives outside the City of Carlsbad (71.8 percent),
- Starts the work day between 7 to 9 a.m. (42.5 percent),
- Ends the work day between 5 to 6 p.m. (46.6 percent),

- Has a one-way commute duration of less than 30 minutes (59.6 percent),
- Drives alone five days per week (59.4 percent), and
- Could be motivated to use a shuttle/ trolley as a commute option (45.5 percent).

With a total of 532 responses, the Employer Survey and Employee TDM Survey was conducted in about 12 weeks, and included fourteen employment sites overall.





SANDAG's iCommute Programs (Source: iCommute)

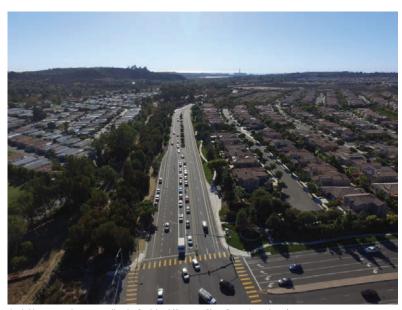
# FIGURE 6-6 CITY OF CARLSBAD AUTO TRAVEL ACTIVITY La Jolla County of San Diego Santa Ysabel Mesa Grande Capitan Grande City of Carlsbad Auto Travel Activity Coronado UNITED STATES MEXICO (SANDAG)

# SANDAG iCommute Travel Analyses

SANDAG iCommute also collects employment and trip distribution data for the San Diego region and analyzes its findings in a series of datasets, which are displayed in the following figures.

Figures 6-6 through 6-8 represent the various characteristics of commute trip making associated with the City of Carlsbad.

Figure 6-6 shows trip volumes associated with the City of Carlsbad, reflecting higher volumes in North County.



Aerial imagery of cars traveling in Carlsbad (Source: Chen Ryan Associates)

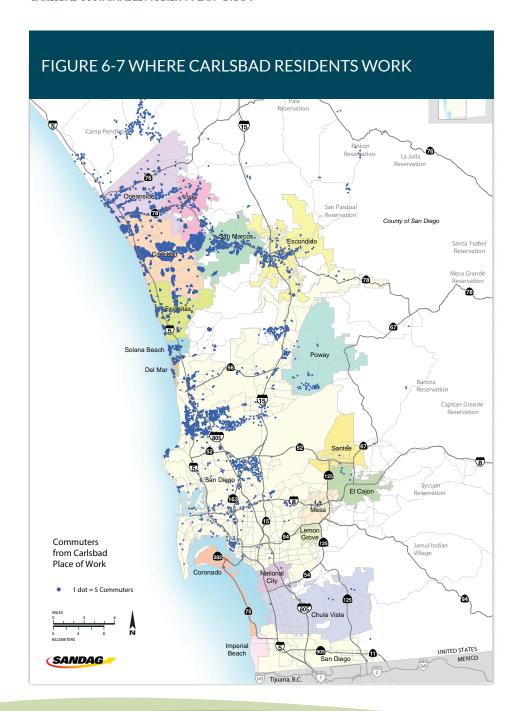


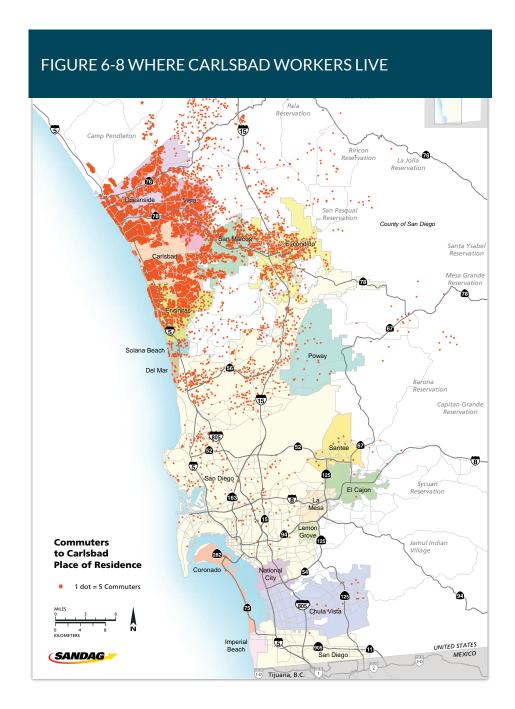
Figure 6-7 shows the density of Carlsbad resident work locations. As shown, there are two general regions where Carlsbad residents work, including primarily along the SR-78 corridor and near Sorrento Valley/Mira Mesa

Figure 6-8 shows the residential locations for people who work in Carlsbad. As shown, Carlsbad workers tend to live in North County, especially in the cities of Carlsbad, Encinitas, Vista, Oceanside and San Marcos. However, Carlsbad workers do live as far away as Chula Vista and Otay Mesa.

SANDAG also conducted an Employee Commute Survey in 2017. The survey consisted of several questions to determine how employees were currently commuting to work and which forms of alternative transportation they are interested in using.

There were 176 employee respondents. The following key findings were reported as noteable commuter characteristics:

- Most City of Carlsbad employees commute from the North County Coastal sub-region (64.8%).
- 90% of respondents currently drive alone to work.
- 66% of respondents are willing to try a new, sustainable commute choice.
- 48% of respondents are most interested to try carpooling.
- 39% of respondents indicated a Guaranteed Ride Home in the event of an emergency would help them make the choice not to drive alone.



Staff with SANDAG's iCommute program made several recommendations for the City of Carlsbad, including to promote carpooling, biking, and vanpooling.

#### **US Census Bureau Analysis**

The US Census Bureau also reports useful information about commute patterns. Data from 2015 shows that roughly 61,200 people commute to Carlsbad each day for work, and an additional 10,500 Carlsbad residents work in the City of.

The remaining 35,500 Carlsbad residents commute to jobs outside Carlsbad. Table 6-1 shows the most popular locations, which are City of San Diego (25.2%) and the City of Carlsbad (22.8%).

According to OnTheMap Census Data shown in Table 6-2, of those who work in Carlsbad, 14.6 percent live in the City of Carlsbad. The largest percentage of people (14.7 percent) who work in Carlsbad live in the City of Oceanside.

# **TDM Ordinance Passage**

The City Council passed a TDM Ordinance in February 2019. This ordinance establishes a policy framework to help the City implement its trip reduction strategies outlined in this chapter and to encourage collaboration between private businesses and City and regional representatives.

Table 6-1 Where Carlsbad Residents Work

City	Count	Percent		
San Diego	11,588	25.2%		
Carlsbad	10,471	22.8%		
Encinitas	2,665	5.8%		
Oceanside	2,426	5.3%		
Vista	2,016	4.4%		
San Marcos	1,797	3.9%		
Escondido	1,112	2.4%		
Los Angeles	1,087	2.4%		
Irvine	776	1.7%		
Solana Beach	685	1.5%		
All Other Locations	11,360	24.7%		
Total	45,983	100.0%		

Table 6-2 Where Carlsbad Workers Live

City	Count	Percent
Oceanside	10,514	14.7%
Carlsbad	10,471	14.6%
San Diego	8,720	12.2%
Vista	5,876	8.2%
San Marcos	3,961	5.5%
Escondido	3,164	4.4%
Encinitas	3,089	4.3%
Los Angeles	1,317	1.8%
Chula Vista	723	1.0%
Poway	573	0.8%
All Other Locations	23,273	32.5%
Total	71,681	100.0%

The TDM Ordinance makes several critical recommendations, including implementation of the following:

- First and last mile strategies encompassing bike network connectivity, intersection treatments making the environment friendlier to cyclists, bike parking and accommodations at transit stations, bikeshare, wayfinding, and pedestrian network improvements
- Wayfinding for drivers
- Parking technology
- Kiss-and-ride curbs
- Satellite park-and-ride locations
- Shared parking
- Priority parking for carpools and van pools
- Permit parking
- Transit stop amenities
- Transit signal priority
- Carpool and vanpool promotion
- Rideshare
- Shuttles
- Carshare
- EV Charging





#### IN THIS CHAPTER

- SMP Project Database
- Prioritization Criteria
- Project Prioritization Analysis and Results
- Estimated New Active Travel Trips

This chapter of the SMP presents an Action Plan that serves to consolidate recommendations from the various mobility plans and then prioritize them. The chapter gives City staff a short-range implementation plan that will support a coordinated effort to improve mobility-related sustainability within the city. The SMP Project Database is a core component of the SMP Action Plan. It includes recommendations from 10 prior Carlsbad mobility plans, as well as unbuilt planned recommendations from this current planning process, especially the planned networks presented in Chapter Five. The Action Plan chapter begins with a presentation of the SMP Project Database, then presents the project prioritization criteria, along with the prioritization analysis and results. This assessment is intended to provide City staff and community members with an implementation plan that leads to the highest quality, multimodal and sustainable mobility networks in the shortest amount of time. Lastly, the chapter presents estimates of new bike and walk trips anticipated to be generated by full buildout of the SMP planned networks.

The SMP has been referred to as "a plan of plans" in that it seeks to respect recent multimodal planning efforts in the City of Carlsbad by consolidating their respective recommendations into a single, searchable project database for use by city staff and community members in various aspects of implementing multimodalism in the city.

A total of 246 project recommendations were culled from 10 prior plans, as well as from the current plan, and were then assigned to 95 corridors and areas across the city. The corridor segments were generally defined by intersecting circulation element roadways. Each of the 246 projects were assigned to one of the corridors or areas.

Figure 7-1 displays the SMP project corridor and area extents with their respective IDs, while Table 7-1 presents the corridors and areas with a basic description of the types of project recommendations being made for the corridor or area. Appendix I provides a table with the SMP Project Database and complete project descriptions.

After the projects were assigned to corridors and areas, each of these locations was prioritized.

Table 7-2 describes the prioritization criteria and their minimum and maximum point values, along with how their point values were assigned. The prioritization criteria largely flowed out of the community engagement process and included factors related to density, equity and connectivity.

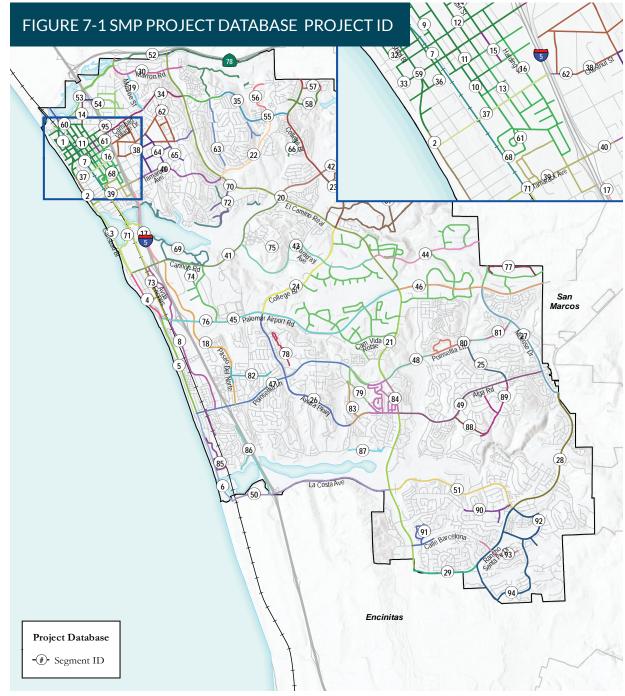


Table 7-1 Project Database with Project Recommendation Type

					Project Recommendation		ion Type
PR ID	Street	Corridor	From	То	Bicycle	Pedestrian	Transit
1	Carlsbad Bl	Corridor	N City Boundary	Carlsbad Village Dr	х	х	х
2	Carlsbad Bl	Corridor	Carlsbad Village Dr	Tamarack Av	х	х	х
3	Carlsbad Bl	Corridor	Tamarack Av	Cannon Rd	х	х	-
4	Carlsbad BI	Corridor	Cannon Rd	Palomar Airport Rd	х	х	-
5	Carlsbad Bl	Corridor	Palomar Airport Rd	Poinsettia Ln	x	х	-
6	Carlsbad Bl	Corridor	Poinsettia Ln	La Costa Av	х	x	-
7	Rail ROW	Corridor	Carlsbad Bl	Tamarack Av	-	х	-
8	Avenida Encinas	Corridor	Cannon Rd	Poinsettia Ln	х	х	х
9	State St	Corridor	Laguna Dr	Oak Av	-	х	-
10	Tyler St	Corridor	Oak Av	Chestnut Av	-	х	-
11	Roosevelt St	Corridor	Laguna Dr	Magnolia Av	-	х	-
12	Madison St	Corridor	Laguna Dr	Carlsbad Village Dr	-	Х	-
13	Madison St	Corridor	Carlsbad Village Dr	Magnolia Av	-	х	-
14	Jefferson St	Corridor	Interstate 5 over- pass	Carlsbad Village Dr	Х	-	-
15	Jefferson St	Corridor	Carlsbad Village Dr	Pine Av	-	х	-
16	Harding St	Corridor	Carlsbad Village Dr	Magnolia Av	-	x	-
17	I-5 (ChinquTo Cannon)	Corridor	Chinquapin Av	Cannon Rd	х	-	-
18	Paseo Del Norte	Corridor	Cannon Rd	Poinsettia Ln	х	-	-
19	Monroe St	Corridor	Marron Rd	Carlsbad Village Dr	-	х	-
20	El Camino Real	Corridor	N. City Boundary	Palomar Airport Rd	х	х	-
21	El Camino Real	Corridor	Palomar Airport Rd	Olivenhain Rd	х	х	х
22	Tamarack Ave	Corridor	El Camino Real	Carlsbad Village Dr	х	-	-
23	College BI	Corridor	N. City Boundary	El Camino Real	х	х	-
24	College BI	Corridor	El Camino Real	Palomar Airport Rd	-	-	х

					Project F	Recommendat	ion Type
PR ID	Street	Corridor	From	То	Bicycle	Pedestrian	Transit
25	El Fuerte St	Corridor	Poinsettia Ln	Alga Rd	-	х	-
26	Aviara Pkwy	Corridor	Palomar Airport Rd	El Camino Real	-	Х	-
27	Melrose Dr	Corridor	Palomar Airport Rd	Rancho Santa Fe Rd	х	-	-
28	Rancho Santa Fe Rd	Corridor	Melrose Dr	La Costa Ave	х	-	-
29	Olivenhain Rd	Corridor	El Camino Real	La Costa Ave	х	-	-
30	Marron Rd	Corridor	N. City Boundary	1100' east of ECR	-	х	х
31	Las Flores Dr	Area	SB Ramps	NB Ramps	-	Х	-
32	Christiansen Wy	Corridor	Garfield St	Washington St	-	-	-
33	Carlsbad Village Dr	Corridor	Ocean St	Interstate 5	х	Х	х
34	Carlsbad Village Dr	Corridor	Interstate 5	El Camino Real	х	х	-
35	Carlsbad Village Dr	Corridor	El Camino Real	College BI	х	-	-
36	Oak Ave	Corridor	Lincoln St	Washington St	-	Х	-
37	Chestnut Ave	Corridor	Carlsbad Bl	Interstate 5	х	Х	-
38	Chestnut Ave	Corridor	Interstate 5	El Camino Real	х	х	-
39	Tamarack Ave	Corridor	Carlsbad Bl	Interstate 5	х	х	-
40	Tamarack Ave	Corridor	Interstate 5	El Camino Real	х	х	-
41	Cannon Rd	Corridor	Carlsbad Bl	El Camino Real	х	Х	-
42	Cannon Rd	Corridor	El Camino Real	eastern terminus	х	-	-
43	Faraday Ave	Corridor	Cannon Rd	El Camino Real	-	х	х
44	Faraday Ave	Corridor	El Camino Real	E. City Boundary	-	х	-
45	Palomar Airport Rd	Corridor	Carlsbad Bl	El Camino Real	х	х	х
46	Palomar Airport Rd	Corridor	El Camino Real	E. City Boundary	х	-	-
47	Poinsettia Ln	Corridor	Carlsbad BI	El Camino Real	-	х	-
48	Poinsettia Ln	Corridor	El Camino Real	Melrose Dr	х	-	-
49	Alga Rd	Corridor	El Camino Real	Melrose Dr	-	х	-

					Project Recommendation		ion Type
PR ID	Street	Corridor	From	То	Bicycle	Pedestrian	Transit
50	La Costa Ave	Corridor	Carlsbad Bl	El Camino Real	Х	-	-
51	La Costa Ave	Corridor	El Camino Real	Rancho Sante Fe Rd	Х	Х	-
52	Buena Vista Creek Eco	Area	N/A	N/A	-	Х	-
53	Buena Vista Lagoon	Area	N/A	N/A	-	Х	-
54	Buena Vista ES	Area	N/A	N/A	-	Х	-
55	Calavera Hills PMP	Area	N/A	N/A	-	Х	-
56	Hope ES School Area	Area	N/A	N/A	-	Х	-
57	Calavera Hills MS	Area	N/A	N/A	-	Х	-
58	Calavera Hills ES	Area	N/A	N/A	-	х	-
59	Lincoln Plaza	Area	N/A	N/A	-	Х	-
60	Village Streets	Area	N/A	N/A	-	х	-
61	Barrio Streets	Area	N/A	N/A	-	х	-
62	Carlsbad HS PMP	Area	N/A	N/A	-	х	-
63	Hidden Canyon Park	Area	N/A	N/A	-	Х	-
64	Valley MS	Area	N/A	N/A	-	х	-
65	Magnolia ES	Area	N/A	N/A	-	х	-
66	SDG&E Corridor	Corridor	N/A	N/A	-	х	-
67	Carlsbad Highlands Eco	Area	N/A	N/A	-	х	-
68	Jefferson ES	Area	N/A	N/A	-	х	-
69	Agua Hedionda Lagoon	Area	N/A	N/A	-	х	-
70	Kelly Dr / Park Dr	Corridor	El Camino Real	Alondra Wy	х	х	-
71	Canyon Park	Area	N/A	N/A	х	х	-
72	Kelly ES	Area	N/A	N/A	-	х	-
73	CRT (Cannon To Palomar)	Corridor	Cannon Rd	Palomar Airport Rd	Х	Х	-

					Project Recommendation		ion Type
PR ID	Street	Corridor	From	То	Bicycle	Pedestrian	Transit
74	Legoland	Area	N/A	N/A	-	Х	-
75	The Kirgis Trail Conn	Corridor	Twain Av	Existing Trail	-	Х	-
76	Connector Study Area	Area	N/A	N/A	х	х	Х
77	Carlsbad Raceway Park	Corridor	Melrose Dr	Lionshead Av	-	Х	-
78	SDG&E (Plum to Poins)	Corridor	Plum Tree Ct	Poinsettia Ln	-	х	-
79	Aviara Community Park	Area	N/A	N/A	-	х	-
80	Poinsettia ES	Area	N/A	N/A	-	х	-
81	Carillo ES	Area	N/A	N/A	-	Х	-
82	Pacific Rim	Area	N/A	N/A	-	х	-
83	Aviara Oaks MS & ES	Area	N/A	N/A	-	Х	-
84	Aviara Oaks PMP	Area	N/A	N/A	-	х	-
85	Avenida Encinas	Area	N/A	N/A	-	Х	-
86	Batiquitos Lagoon	Area	N/A	N/A	х	-	-
87	Batiquitos Lagoon Eco	Area	N/A	N/A	-	Х	-
88	SDG&E (Alga to El Fuerte)	Corridor	Alga Rd	El Fuerte	-	Х	-
89	La Costa Meadows	Area	N/A	N/A	-	х	-
90	La Costa Heights	Area	N/A	N/A	-	х	-
91	El Camino Creek	Area	N/A	N/A	-	Х	-
92	La Costa Ave / Cam Coches	Corridor	Olivenhain Rd	Rancho Santa Fe Rd	Х	Х	-
93	Mission Estancia	Area	N/A	N/A	-	Х	-
94	La Costa HS School Area	Area	N/A	N/A	-	Х	-
95	Grand Ave	Corridor	Grand Ave terminus	Pio Pico Dr	Х	Х	-

Table 7-2 Prioritization Criteria

Prioritization Criteria	Point Value
Population Density: Population density was calculated within a 500' buffer area of each project using a Census Block Group-level population dataset from the 2017 American Community Survey five-year estimate. The category breaks determining the point values of this criterion were assigned by sorting project area population densities in descending order and dividing the projects into five roughly equal categories. Higher population densities are associated with higher implementation priority. The category breaks governing this criterion's point values are as follows:	
<ul> <li>Lowest density (3.30 persons per acre and below) = 0 points</li> </ul>	
<ul> <li>Medium-Low density (3.33 – 5.14 persons per acre) = 0.5 points</li> </ul>	0 - 2
<ul> <li>Medium density (5.16 – 6.36 persons per acre) = 1 point</li> </ul>	
• Medium-High density (6.40 – 8.82 persons per acre) = 1.5 points	
Highest Density (9.56 persons per acre or greater) = 2 points	
Employment Density: Employment density was calculated within a 500' buffer area of each project using a Census Block-level employment dataset from the 2016 US Census Longitudinal Employer-Household Dynamics estimate. The category breaks determining the point values of this criterion were assigned by sorting project area employment densities in descending order and dividing the projects into five roughly equal categories. Higher employment density is associated with higher implementation priority. The category breaks governing this criterion's point values are as follows:	
<ul> <li>Lowest density (1.2 persons per acre and below) = 0 points</li> </ul>	
<ul> <li>Medium-Low density (1.29 – 2.12 persons per acre) = 0.5 points</li> </ul>	0 - 2
<ul> <li>Medium density (2.21 – 4.12 persons per acre) = 1 point</li> </ul>	
• Medium-High density (4.32 – 7.08 persons per acre) = 1.5 points	
• Highest Density (7.72 persons per acre or greater) = 2 points	

Prioritization Criteria	Point Value
Median Household Income: Median Household Income was calculated within a 500' buffer area of each project using Census Block Group-level median household income dataset from the 2017 American Community Survey five-year estimate. The category breaks determining the point values of this criterion were assigned by sorting project area median household incomes in descending order and dividing the projects into four roughly equal categories. Lower household income is associated with higher implementation priority. The category breaks governing this criterion's point values are as follows:  • Highest median income (\$119,210 or above) = 0 points  • Medium-High median income (\$101,699 - \$118,174) = 1 point  • Medium-Low median income (\$76,965 - \$101,235) = 2 points  • Lowest median income (\$76,669 and below) = 3 points	0 - 3
CalEnvrioScroon (CES): CES is a composite index by Consus Tract which reflects pollution burden and vulnerability	
CalEnvrioScreen (CES): CES is a composite index by Census Tract which reflects pollution burden and vulnerability across the state. Higher CES scores reflect higher exposure to pollution. An average weighted CES score was calculated for each project by intersecting the project extents with the CES coverage. The category breaks determining the point values of this criterion were assigned by sorting average weighted scores in descending order and dividing the projects into four roughly equal categories. Higher CES scores are associated with higher implementation priority. The CES category breaks governing this criterion's (shown as the CES score's conversion to statewide percentile) point values are as follows:	
• Low CES score (9.18 and below) = 0 points	0 - 3
• Medium-Low CES score (9.35 - 11.47) = 1 point	
• Medium-High CES score (11.53 - 13.72) = 2 points	
High CES score (13.95 and above) = 3 points	

Prioritization Criteria	Point Value
Senior Density: Senior population (ages greater than or equal to 65) density was calculated within a 500' buffer area of each project using Census Block Group-level population dataset from the 2017 American Community Survey five-year estimate. The category breaks determining the point values of this criterion were assigned by sorting project area population densities in descending order and dividing the projects into three roughly equal categories. Higher densities of senior population are associated with higher implementation priority. The category breaks governing this criterion's point values are as follows:  • Lowest density (0.66 persons per acre and below) = 0 points  • Medium density (0.71 – 1.10 persons per acre) = 2 points  • Highest density (1.14 persons per acre or greater) = 4 points	0 - 4
Youth Density: Youth population (ages less than or equal to 16) density was calculated within a 500' buffer area of each project using Census Block Group-level population dataset from the 2017 American Community Survey five-year estimate. The category breaks determining the point values of this criterion were assigned by sorting project area population densities in descending order and dividing the projects into three roughly equal categories. Higher densities of youth population are associated with higher implementation priority. The category breaks governing this criterion's point values are as follows:  • Lowest density (0.83 persons per acre and below) = 0 points  • Medium density (0.84 – 1.33 persons per acre) = 2 points  • Highest density (1.35 persons per acre or greater) = 4 points	0 - 4
Key Destination Connectivity: Each project serving a key destination in the City of Carlsbad received point values from the accessibility score as described in Chapter 2 of this document. Lower accessibility scores are associated with higher implementation priority.  Accessibility Score =	0 - 4
Total Possible Points	22

Exhibit 1
CARLSBAD SUSTAINABLE MOBILITY PLAN - DRAFT

Figure 7-2 displays the final project prioritization scores for the 95 project corridors and areas based on the criteria provided in Table 7-2. Projects with the highest implementation priority are shown in red and orange, with prioritization scores over 10 out of a total possible score of 22.

Table 7-3 presents the highest ranked 31 projects from the SMP Project Database, with prioritization scores of 10 or above, which should be the focus of near-term implementation.

Table 7-4 presents a brief project description for each of the 31 top priority projects as defined in Table 7-3.

Appendix J presents the final prioritization scores and ranking for the entire database of 95 projects.

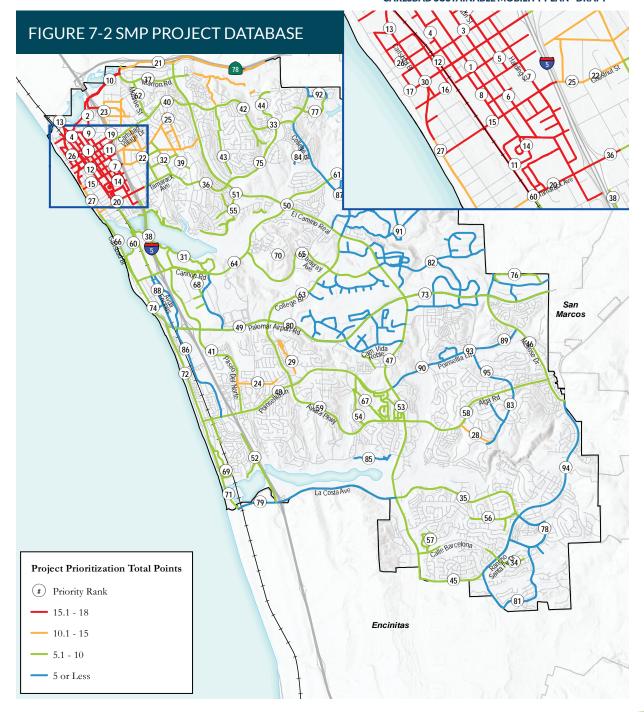


Table 7-3 Project Database Prioritization and Ranking (Top 31)

Rank	PR ID	Street	Corridor	From	То	Population Density	Employment Density	Median Household Income	EnviroScreen	Senior Density	Youth Density	Key Destination Accessibility Score	TOTAL
1	11	Roosevelt St	Corridor	Laguna Dr	Magnolia Av	2	2	3	3	4	4	0.00	18.00
2	14	Jefferson St	Corridor	Interstate 5 over- pass	Carlsbad Village Dr	2	2	3	3	4	4	0.00	18.00
3	12	Madison St	Corridor	Laguna Dr	Carlsbad Village Dr	2	2	3	3	4	4	0.00	18.00
4	9	State St	Corridor	Laguna Dr	Oak Av	2	2	3	3	4	4	0.00	18.00
5	15	Jefferson St	Corridor	Carlsbad Village Dr	Pine Av	2	2	3	3	4	4	0.00	18.00
6	13	Madison St	Corridor	Carlsbad Village Dr	Magnolia Av	2	1.5	3	3	4	4	0.00	17.50
7	16	Harding St	Corridor	Carlsbad Village Dr	Magnolia Av	2	1.5	3	3	4	4	0.00	17.50
8	10	Tyler St	Corridor	Oak Av	Chestnut Av	2	1.5	3	3	4	4	0.00	17.50
9	60	Village Streets	Area	N/A	N/A	2	2	3	3	4	2	1.33	17.33
10	53	Buena Vista Lagoon	Area	N/A	N/A	2	1	3	3	4	4	0.00	17.00
11	61	Barrio Streets	Area	N/A	N/A	2	1	3	3	4	4	0.00	17.00
12	7	Rail ROW	Corridor	Carlsbad Bl	Tamarack Av	2	2	3	2	4	4	0.00	17.00
13	1	Carlsbad Bl	Corridor	N City Boundary	Carlsbad Village Dr	1.5	2	3	2	4	2	2.17	16.67
14	68	Jefferson ES	Area	N/A	N/A	2	0.5	3	3	4	4	0.00	16.50
15	37	Chestnut Ave	Corridor	Carlsbad Bl	Interstate 5	2	1	3	2	4	4	0.33	16.33
16	36	Oak Ave	Corridor	Lincoln St	Washington St	2	1.5	3	1	4	4	0.00	15.50
17	33	Carlsbad Village Dr	Corridor	Ocean St	Interstate 5	1.5	2	3	3	4	2	0.00	15.50
18	31	Las Flores Dr	Area	SB Ramps	NB Ramps	2	0.5	3	2	4	4	0.00	15.50
19	95	Grand Ave	Corridor	Grand Ave terminus	Pio Pico Dr	1.5	2	2	2	4	4	0.00	15.50
20	39	Tamarack Ave	Corridor	Carlsbad Bl	Interstate 5	2	0.5	2	2	4	4	0.00	14.50

#### **ACTION PLAN**

Rank	PR ID	Street	Corridor	From	То	Population Density	Employment Density	Median Household Income	EnviroScreen	Senior Density	Youth Density	Key Destination Accessibility Score	TOTAL
21	52	Buena Vista Creek Eco	Area	N/A	N/A	1	1	3	3	2	2	0.00	12.00
22	38	Chestnut Ave	Corridor	Interstate 5	El Camino Real	1.5	1	2	1	4	2	0.33	11.83
23	54	Buena Vista ES	Area	N/A	N/A	1.5	1	2	1	4	2	0.00	11.50
24	82	Pacific Rim	Area	N/A	N/A	2	0.5	1	0	4	4	0.00	11.50
25	62	Carlsbad HS PMP	Area	N/A	N/A	1	1	2	1	4	2	0.00	11.00
26	32	Christiansen Wy	Corridor	Garfield St	Washington St	1	2	3	1	4	0	0.00	11.00
27	2	Carlsbad BI	Corridor	Carlsbad Village Dr	Tamarack Av	2	1.5	3	0	4	0	0.00	10.50
28	88	SDG&E (Alga to El Fuerte)	Corridor	Alga Rd	El Fuerte	1.5	0	1	0	4	4	0.00	10.50
29	78	SDG&E (Plum to Poins)	Corridor	Plum Tree Ct	Poinsettia Ln	0.5	2	2	2	0	4	0.00	10.50
30	59	Lincoln Plaza	Area	N/A	N/A	1.5	2	3	0	4	0	0.00	10.50
31	69	Agua Hedionda Lagoon	Area	N/A	N/A	0.5	1.5	2	2	2	0	2.00	10.00

Table 7-4 High Priority Project Descriptions (Top 31 Projects)

Rank	PRID	Street	From	То	Project Description	Source
					Improvements at intersection of Roosevelt St/Grand Av	PMP
1	11	Roosevelt St	Laguna Dr	Magnolia Av	Improvements at intersection of Roosevelt St/Laguna Dr	PMP
					Improvements at intersection of Roosevelt St/Oak Av	PMP
2	14	Jefferson St	Interstate 5 overpass	Carlsbad Village Dr	Bicycle improvements and parking removal	Community comment
					Improvements at intersection of Madison Street/Laguna Drive	PMP
3	12	Madison St	Laguna Dr	Carlsbad Village Dr	Sidewalk Infill from Laguna Dr to Grand Av	Community comment
4	9	State St	Legune Dr	Oak Av	State St / Grand Av civic space improvements	VBMP
4	9	State St	Laguna Dr	Oak AV	Roadway reconfiguration	VBMP
5	15	Jefferson St	Carlsbad Village Dr	Pine Av	Improvements at intersection of Jefferson Street/Oak Avenue	PMP
					Improvements at intersection of Madison St/Oak Av	PMP
6	13	Madison St	Carlsbad Village Dr	Magnolia Av	Street light improvements	Community comment
					Roadway improvements along Harding St from Pine Av to Chestnut Av	VBMP
					Street improvements along Harding St from Grand Av to Pine Av	VBMP
7	16	Harding St	Carlsbad Village Dr	Magnolia Av	Sidewalk infill, traffic control, wayfinding, curb extensions along Harding St from Grand Av to Chestnut Av	PMP
					Improvements at intersection of Harding St/Oak Av	PMP
					Street light improvements	Community comment
					Streetscape improvements	VBMP
8	10	Tyler St	Oak Av	Chestnut Av	Improvements at intersection of State St/Laguna Dr	PMP
0 1					Street light improvements	Community comment

Rank	PR ID	Street	From	То	Project Description  Pedestrian lighting	Source VBMP	
						Street planters and sharrows; roadways less than 48 feet without bike lane	VBMP
		Village Streets N/A			Street planters and sharrows; roadways less than 48 feet without bike lane	VBMP	
				Transition street improvements and entry features	VBMP		
9	60		N/A	N/A	Alleyway pedestrian improvements	VBMP	
7					EV charging stations & NEV Shuttles	Community comment	
					ADA Priority Level 1 - Village Area: Right-of-Way adjacent to public facilities	ADA	
					ADA Priority Level 2 - Village Area: 1/4 mile from public facilities	ADA	
					ADA Priority Level 3 - Village Area: Remaining (mid-term) projects in study area	ADA	
					Type 1 - Nature Trail		
10	53	Buena Vista Lagoon	N/A	N/A	Type 2 - Recreational Trail		
					Sidewalk infill, wayfinding, freeway crossing	PMP	
					ADA improvements	VBMP	
					Traffic calming improvments	VBMP	
11	61	Barrio Streets	N/A	N/A	Pedestrian lighting	VBMP	
					Transition street improvements and entry features	VBMP	
					Alleyway pedestrian improvements	VBMP	
12	7	Rail ROW	Carlsbad Bl	Tamarack Av	Grade separation	VBMP	

Rank	PRID	Street	From	То	Project Description	Source	
					Pedestrian lighting	VBMP	
					Restriping for bike and ped comfort	VBMP	
					Pedestrian improvements	Community comment	
					Bulbouts at all RRFB	City staff comment	
	1 Carlsbad Bl N City Boundary		EcoCounter locations	City staff comment			
13		Carlsbad Bl	N City Boundary	Carlsbad Village Dr	Transformative Corridor	Transformative Corridor Candidate	
					Pedestrian crossings	CATS	
					Roadway alignment	CATS	
					Transit stop improvements	CATS	
					Comfort Stations (quarter- to half-mile spacing)	Coastal Mobility Readiness	
4.4	<b>,</b> 0	40 1.65 50	N/A	SRTS improvements	PMP		
14	68	Jefferson ES	N/A	N/A	SRTS improvements	SMP	
			Carlsbad Bl	Interstate 5	Railroad crossing improvement along Chestnut Av from Washington St to Tyler St	VBMP	
15	37	Chestnut Ave			Sidewalk infill, wayfinding, rail crossing, transit stop improvements along Chestnut Av from Carlsbad BI to Eureka PI	PMP	
					Bike improvements along Chestnut Av from Carlsbad BI to EI Camino Real	Community comment	
					Bike and ped crossing railroad tracks	Livable Streets	
					Street improvements along Oak Av from Ocean St to I-5	VBMP	
16	36	Oak Ave	Lincoln St	Washington St	Improve CRT entry along Oak Av	VBMP	
	10					Sidewalk improvements	Community comment

Rank	PRID	Street	From	То	Project Description  Bike and ped crossing improvements		
					Streetscape improvements		
					Streetscape improvements		
17	33	Carlsbad Village Dr	Ocean St	Interstate 5	Improvements at intersection of Washington St/Carlsbad Village Dr	PMP	
				Transit stop improvements	CATS		
					Mobility Hub at Carlsbad Village Coaster Station	Coastal Mobility Readiness	
					I-5 crossing pedestrian improvements on Carlsbad Village Dr	Caltrans	
18	31	Las Flores Dr	SB Ramps	NB Ramps	I-5 crossing pedestrian improvements on Las Flores Drive	Caltrans	
19	95	Grand Ave	Grand Ave terminus	Pio Pico Dr	Provide grade separated shared-use (bike/ped only) crossing under I-5 between the terminus of Grand Av to Pio Pico Dr		
					Improve CRT entry along Tamarack Av	VBMP	
20	39	Tamarack Ave	Carlsbad Bl	Interstate 5	Transformative Corridor	Transformative Corridor Candidate	
					Type 1 - Nature Trail	Coastal Mobility Readiness Caltrans Caltrans VBMP Transformative	
				N/A	Type 1 - Nature Trail	Trails Master Plan	
04	50		N/A		Type 3 - Wide Dirt Trail or Utility Roadbed	Trails Master Plan	
21	52	Buena Vista Creek Eco			Type 4 - Roadside Trail	Trails Master Plan	
					Type 1 - Nature Trail	Trails Master Plan	
					Type 1 - Nature Trail	Trails Master Plan	
					Improvements at intersection of Highland Dr/Chestnut Av	PMP	
					Improvements at intersection of Pio Pico Dr/Chestnut Av	PMP	
22	38	Chestnut Ave	Interstate 5	El Camino Real	I-5 crossing pedestrian improvements	Caltrans	
						Bike improvements	

Rank	PR ID	Street	From	То	Project Description	Source
00	T 4	D Vista FC	N1/A	N/A	SRTS improvements	PMP
23	54	Buena Vista ES	N/A		SRTS improvements	SMP
24	82	Pacific Rim	N/A	N/A	SRTS improvements	SMP
٥٢	<b>/</b> 0	Cardaha d LIC DNAD			SRTS improvements	PMP
25	62	Carlsbad HS PMP	N/A	N/A	SRTS improvements	SMP
26	32	Christiansen Wy	Garfield St	Washington St	Christiansen Wy improvements	VBMP
					Pedestrian lighting	VBMP
					Pedestrian improvements	Community comment
			Road diet on Carlsbad BI from Pine Av to Tamarack Av	Community comment		
				r Tamarack Av	Bulbouts at all RRFB	City staff comment
27	2	Carlsbad Bl	Carlsbad Village Dr		EcoCounter locations	City staff comment
27	Z	Cal ISDau Di	Carisbau Village Di		Transformative Corridor	Transformative Corridor Candidate
					Pedestrian crossings	CATS
					Roadway alignment	CATS
					Transit stop improvements	CATS
					Comfort Stations (quarter- to half-mile spacing)	Coastal Mobility Readiness
28	88	SDG&E (Alga to El Fuerte)	Alga Rd	El Fuerte	Type 3 - Wide Dirt Trail or Utility Roadbed	Trails Master Plan
29	78	SDG&E (Plum to Poins)	Plum Tree Ct	Poinsettia Ln	Type 3 - Wide Dirt Trail or Utility Roadbed	Trails Master Plan
30	59	Lincoln Plaza	N/A	N/A	Signature plaza improvement	VBMP

#### **ACTION PLAN**

Rank	PR ID	Street	From	То	Project Description	Source
					New trail connection along Agua Hedionda Lagoon from Railroad to Cove Dr	CATS
					Type 4 - Roadside Trail	Trails Master Plan
	69 Agua Hedionda Lagoon N/A	N/A	Type 1 - Nature Trail	Trails Master Plan		
31			Type 1 - Nature Trail	Trails Master Plan		
					Type 4 - Roadside Trail	Trails Master Plan
				Type 2 - Recreational Trail	Trails Master Plan	
					Type 1 - Nature Trail	Trails Master Plan

# **ESTIMATED NEW USERS**

Table 7-5 presents an estimation of current and projected future active transportation trips. Current trips are based upon 2017 American Community Survey (ACS) data, which is the most recent available from the US Census Bureau.

These data measure commute trips only, and therefore were extrapolated further to capture the active travel trips taken by those accessing transit, working from home, and school children who bike and walk to school.

Regional growth estimates were applied based upon SANDAG Series 13 regional growth forecasts, and increased by 1.3% to account for the improved facilities resulting from buildout of the SMP networks, since walking and biking will become viable for more people with an enhanced network. This increase is a conservative estimate based upon experience of other major metropolitan areas.

Table 7-5 Estimated Active Transportation Trips and New Users

Source of Trip	Description of Source	Number of Trips
Carlsbad Census Population	From 2017 American Community Survey (ACS) Estimates	113,147
Current Estimated Total Daily Bicycle Trips (Weekday)	Includes bicycle commuters, Assumption of 15% of work-at-home commuters making one bicycle trip per day, 10% of transit users biking to transit, and 2% of schoolchildren traveling by bike (x2 to reflect round trips)	3,072
Current Estimated Total Daily Walk Trips (Weekday)	Includes walking commuters, Assumption of 50% of work-at-home commuters making one walking trip per day, 85% of transit users walking to transit, and 14.5% of schoolchildren traveling by foot (x2 to reflect round trips)	13,951
Regional 2050 Population Growth Estimates	Based upon SANDAG regional estimates	+29%
2050 Population Estimate	Based upon +29% SANDAG estimate	145,960
2050 Estimated Total Daily Bicycle Trips (Weekday)	Based upon +29% SANDAG estimate and 1.3% network growth enhancement from fully completed network (based upon the experience of other major regions)	4,014
2050 Estimated Total Daily Walk Trips (Weekday)	Based upon 29% SANDAG estimate and 1.3% network growth enhancement from fully completed network (based upon the experience of other major regions)	18,231
Estimated New Bicycle Trips Per Day	Based on current estimates - 2050 estimates	942
Estimated New Walking Trips Per Day	Based on current estimates - 2050 estimates	4,280